Chemical Week

July 28, 1951

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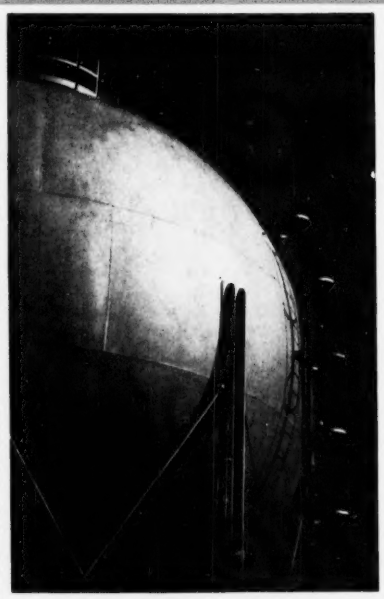

Ammonia: coming up, fat half million ton output boost . . . . . p. 9

Researchers devise process to bulk-produce new wood waste chemical; target: gum arabic market . . p. 21

Leadmakers pilot-plant new sulfide furnace; benefit: rich off-gas for sulfuric . . . . . p. 23

CW Camera visits essential oils labs, sees how product odors are masked to up sales appeal . . . p. 26

More styrene due in '52: it'll ease shortage, but not lick it . . . . . p. 35

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Chemical Week

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Chemical Week (including Chemical Specialties, and Chemical Industries) is published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office: 1309 Noble St., Philadelphia 23, Pa.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions to Chemical Week are solicited in the chemical and process industries only from management men responsible for corporate affairs, purchasing, sales, maketing, packaging, research or chemical functions. Position and company connection must be indicated on subscription order. Address all subscription communications to J. E. Blackburn, r., Director of Circulation. Allow ten days for change or address.

Single copies 35¢. Subscription rates—United States and Possessions $5.00 a year; $8.00 for two years; $10.00 for three years. Canada $6.00 a year; $10.00 for two years; $12.00 for three years. Pan American countries $15.00 a year; $25.00 for two years; $30.00 for three years. All other countries $25.00 a year; $40.00 for two years; $50.00 for three years. Entered as second class matter April 5, 1951, at the Post Office at Philadelphia 23, Pa., under the Act of March 3, 1879. Printed in U.S.A. Copyright 1951 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.

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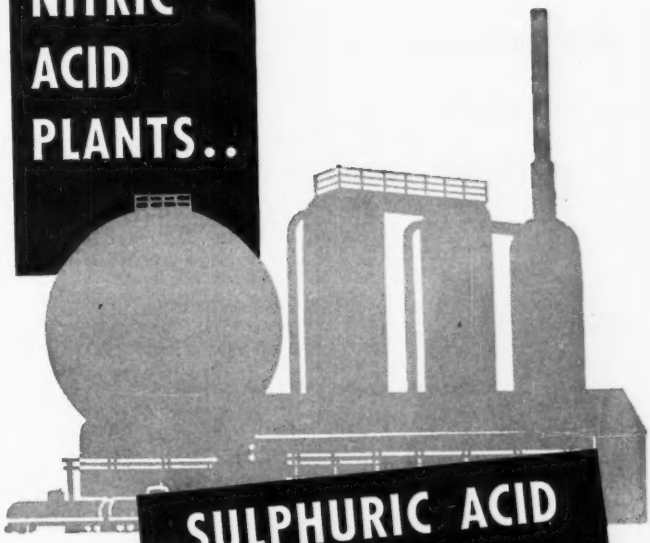

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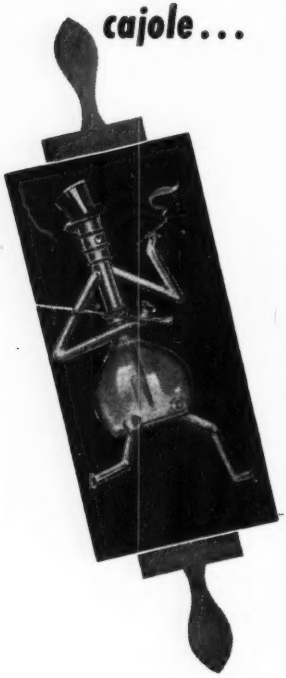

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OPINION . . . . .

Early Downslope

To THE EDITORS: I head read your analysis of alkali trends (Alkali Price Change Ahead, June 30) . . . agree with your findings.

The situation pointed out in this timely article has been developing for many years. . . . I believe the decline of lime-soda caustic production was already on the downslope as early as 1922-23.

The exact rates of change recorded in your article will be most helpful to all interested. . . .

CHARLES OWEN BROWN
Chemical Consultant,
New York, N. Y.

Avoid: Generic

To THE EDITOR: I was much interested in your story "More Black: in the Bag" (July 7). We regret, however, that nowhere in this article did the author associate the trademark "Orlon" with the generic term acrylic fiber, i.e., "Orlon" acrylic fiber. . . .

. . . This is important in order to insure adequate protection of a trademark. Otherwise, there is a tendency on the part of the reader to assume that the trademark itself is generic . . . this contributed in large part to our loss of cellophane as a trademark. . . .

JAS. K. HUNT,
E. I. du Pont de Nemours & Co., Inc.
Wilmington, Del.

Guilty. Only once did we say Orlon synthetic fiber, and although the trademark was religiously capitalized it was (1) used generically (2) not identified as a du Pont property.—ED.

Not Disconsolate

To THE EDITOR: . . . I have read with interest your editorial "The Why of Sulfur" (June 23) . . .

I believe that the brimstone producers have been diligent in their search for new deposits both in the United States and in foreign countries, particularly Mexico. New discoveries have not kept pace with new consumption.

The great increase in the use of fertilizers, particularly superphosphates, has put a burden on sulfur demands. There seems to be no relief in sight at least as long as agricultural prices are at a heavy level.

I agree with your plea . . . for the greater [foreign] use of pyrites. In fact, this already is becoming a reality, although new acid plants, so far as possible, are designed on brimstone because of lower capital costs.

In smaller amounts we are getting sulfur from "sour" petroleum gases, but as yet, this tonnage is not great. The process used, however, lends itself to the production of elemental sulfur from other sources. In addition, there are many small deposits of brimstone which cannot be brought into production at present sulfur selling prices. Then, too, there are the sulfur-bearing sands of California, Utah, Nevada, and New Mexico. At one time, a small flotation plant operated in Utah on such sands . . . but it could not compete with the Texas wells.

All in all, the sulfur picture is not a happy one, but it is not a disconsolate one. We have plenty of pyrite in the United States . . . Canada . . . in various foreign countries. Only a meager percentage of smelter gases is utilized for production of sulfuric acid . . . largely because of their location and freight rates to markets.

Prices may have to advance, but there is a large potential supply within the United States.

CLYDE WILLIAMS
Director
Battelle Memorial Institute
Columbus, Ohio

True, Reader Williams. Sulfur, in terms of potential supply, is not short; brimstone, however, may be. The odds on higher-price sulfur: heavy.—ED.

The Gap is Narrow

To THE EDITOR: Your article "Coming: Tougher Food Law" (July 14) is of special interest to us . . .

As newcomers in the field of development and manufacture of pesticides we are vitally interested in legislation which may result from the Delaney investigation.

Our own testimony (before the Delaney Committee) would hold little interest, perhaps, for the editor of American magazine or for Mr. Bromfield. [Representative Delaney authored an article in the July issue of the American "Peril on Your Food Shelf"; Louis Bromfield testified that virus, the mysterious influenza-like epidemic disease, may be nothing more than manifestations of DDT poisoning; and the increased incidence of heart disease, cancer and leukemia may result from cumulative poisoning by pesticide residues.—ED.] However, the fact is that under existing regulations, rigidly administered by the U. S. Department of Agriculture, the commercial introduction of a new pesticide requires an imposing research effort,

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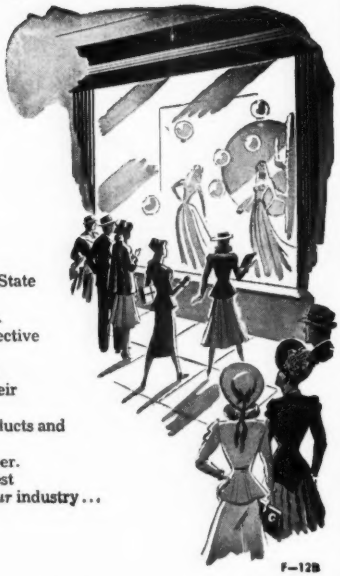

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McGRAW-HILL PUBLICATIONS

OPINION . . . . . .

and well nigh unlimited time, patience and financial resources.

An "irresponsible manufacturer" (Delaney article quote) absolutely cannot function in this field under the strictures that presently apply to it.

The tremendous volume of painstaking scientific work which was presented before the 1950 hearings of the Food and Drug Administration on pesticide residues in foods, was an impressive tribute to the good conscience of this industry and of those who participate in its regulation.

The gap between regulation and complete discouragement of endeavor in this field is even now a narrow one. The growth of modern pest control has been as spectacular and as benefical to mankind as that of modern therapeutic medicine.

The stunting of this growth by legislation conceived in a non-scientific atmosphere will benefit no one.

THOMAS F. CLEARY
Vice President
Geary Chemical Corp.
New York, N. Y.

Right, Reader Cleary. The gap is indeed narrow, the danger of curbing progress great.—ED.

Food Chemicals

CONGRATULATIONS YOUR EXCELLENT SUMMARY FOOD LAW SITUATION. . . . (Coming: Tougher Food Law, July 14.)

R. D. MINTEER,
Monsanto Chemical Co.,
St. Louis, Mo.

Re your report Coming: Tougher Food law. . . . Well done!

HENRY H. FAVOR,
R. T. Vanderbilt Co., Inc.,
New York, N. Y.

. . . I have read your article on chemicals in foods with great interest . . . it should arouse general interest in the importance of and the ramifications surrounding the Delaney Committee activities. . . .

J. PHILIP SMITH,
Chas. Pfizer & Co., Inc.
Brooklyn, N. Y.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.
Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 18, N. Y.

NEWSLETTER

If there's any question in your mind whether the Delaney Committee is an "impartial jury" or—as some claim—a "prosecuting attorney," take a look at these facts:

Although it isn't generally known, the American Magazine article signed by Delaney (which branded food, chemical and insecticide manufacturers irresponsible—CW Newsletter, July 14,) was ghost-written by the magazine staff, with an active assist from Committee Counsel Kleinfeld.

Now Food & Drug Commissioner C. W. Crawford has written a commendatory letter to American Magazine's editors, saying that FDA considers the article a good report on the hearings—"an important contribution."

Crawford likes Delaney's emphasis on alleged inadequate testing of chemical additives in foods, plumps again for a "prior approval" section for food chemicals, similar to the laws governing new drugs (see CW, July 14, p. 11 and Opinion, this issue).

FDA did not see the article before publication, concedes "some technical errors." But it still approves of the general tenor.

Significance of all this: If you make food or agricultural chemicals, or even products that may eventually find food uses, you can expect the Committee and FDA—working hand-in-glove—to press for tighter, possibly repressive restrictions.

One food product is enjoying a boom this week in Illinois. Gov. Stevenson signed the law permitting colored margarine, now margarine makers are splurging on full-page newspaper ads to boost sales. The law passed over dairy farmers' protests—but remember, Illinois is a big soybean state, and the bean growers and processors will gain what the dairies lose.

Wool and rayon are both in the news as the textile industry makes plans for the future:

The Committee on the New England Economy last week (CW Newsletter, July 21) suggested to the President's Council of Economic Advisers that wool might be placed on an equal footing with synthetics by liberalizing labeling laws to permit freer use of reprocessed wool.

But this week Harry J. Devereaux, American Wool Council president, blasted the Committee. Calling their recommendation a "strangely perverted conclusion," he warned that such statements threaten to open loopholes for deception and fraud.

Cortaulds, Ltd. is establishing a beachhead again in the U. S. It sold out its previous operations in 1941 for $60 million, is now forming an American subsidiary, Cortaulds, Inc., to produce 50 million pounds of rayon staple a year.

The eight months' job of demothballing the Diamond Magnesium plant at Painesville, Ohio, is just about finished. Operations are expected to start about August 1.

Diamond Magnesium Co. (subsidiary of Diamond Alkali) will run the plant on a fee basis, will make the metal by electrolysis from Michigan dolomite.

NEWSLETTER

Look for a fast-developing new use for tricresyl phosphate—best known as a vinyl plasticizer.

Over in England, Shell and Rolls Royce are using the compound as a lead-scavenging additive for aviation gasoline. It is used in conjunction with acetylene tetrabromide to volatilize and expel lead deposited from the tetraethyl lead contained in the fuel.

Testing is now under way in the U.S., but American firms are mum about it. British tests show less fouling of valves with the high-boiling, more stable phosphate scavenger.

Some of the early first-six-months' reports reveal peak sales, top earnings; and future financial plans also made news this week:

Dewey & Almy reports first-half earnings of $901,746—up 33% from last year's January-to-June. Sales were also at a record level of over $15 million—up 67%. A second Cry-O-Rap bag plant and a new unit for synthetic rubbers, plasticizers and battery separators are being built.

Standard Oil of Indiana's directors raised regular quarterly dividends from 50¢ to 62½¢ a share, and also declared a stock dividend—one share of Standard Oil Co. (N.J.) for each 40 shares of Indiana.

Pittsburgh Coke & Chemical is raising close to $3½ million by offering 140,243 common shares to its present stockholders. The proceeds will go into the expansion kitty—for its new blast furnace (CW, July 21) and chemical research and production facilities.

National Lead's Board is reportedly considering a stock split. Stock has risen as a result of the Government's interest in titanium.

Additional certificates of necessity were granted by DPA last week for ammonia facilities which, when completed, will add an estimated 100,000 tons per year to U.S. output.

Firms receiving the go-ahead are Shell Chemical Corp. (Dominguez, Calif.), $6,789,000; Dow Chemical Co. (Freeport, Texas), $4,316,800; and Mississippi Chemical Corp. (Yazoo County, Miss.), $5,704,707. Certification in each case was 50%.

Specialty products news: a trend, a new product, an expansion.

The trend is toward self-filling rather than custom-filling of aerosols. At least one of the bigger specialties firms, Boyle-Midway, has decided to fill its own containers, has quietly installed a filling unit in Chicago, is now turning out aerosol insecticides.

The new product is S. C. Johnson's Hard Gloss Glo Coat, now being distributed in Canada. It's a self-polishing floor finish, but there's no mention of wax content on the label. Possible explanation: FTC is considering a ban on calling a product a wax unless it deposits a dry film containing at least 50% wax; high shellac content, on the other hand, gives a product high gloss.

The expansion is a still higher boost by Pittsburgh Plate Glass of Hi-Sil silica rubber pigment production (CW, June 23). The first unit is due to start operating in November, the new one a year later. A $1½ million fast write-off has been granted for the additional capacity.

One of Du Pont's organic chemicals plants is being courted like a belle of the ball: Two New Jersey townships (Upper and Lower Penns Neck) claim it—for tax reasons. Century-old archives are being searched for facts on which a three-man commission will rule.

. . . The Editors

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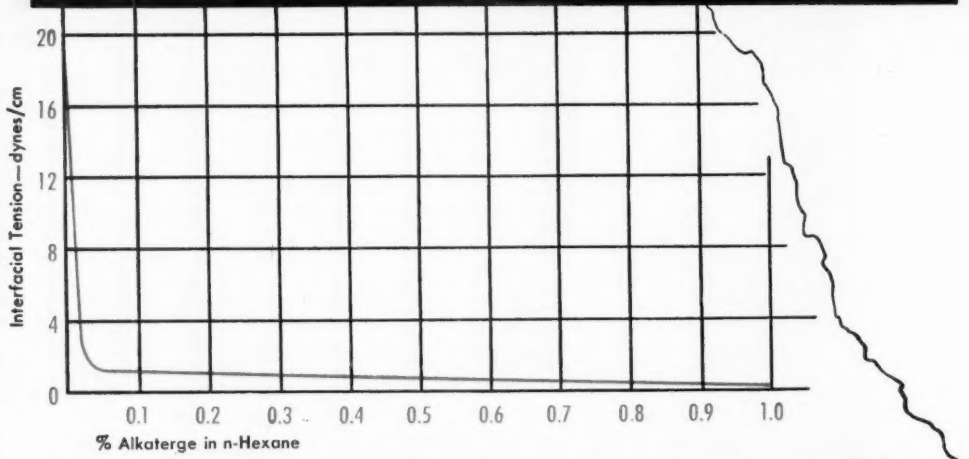

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Solidification Point	—36°C, approx.
Surface Tension of Saturated Aqueous Solution:	Less than 40 dynes/cm
Interfacial Tension against Water of a 0.1% Solution in Mineral Oil	1 to 2 dynes/cm
Flash Point, Cleveland Open Cup	430°F
Solubility	
in Water	Less than 0.002% by weight
in Mineral and Vegetable Oils	Miscible
in Organic Solvents	Miscible with naphtha, benzene, kerosene, carbon tetrachloride, ethyl acetate, acetone, methanol, butanol, and most other organic solvents.

SPECIFICATIONS (tentative)

Oxazoline Content	70% by weight, minimum
Specific Gravity, 25°/25°C	0.925—0.931
Nitrogen (Kjeldahl)	3.80—4.10% by weight
Color, Gardner Scale	15 maximum
Appearance	Clear, free from suspended matter

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BUSINESS & INDUSTRY . . . . .

Crops Call for Ammonia

Fertilizer uses for fixed nitrogen will set pattern for future expansion of synthetic ammonia industry.

Increased population and more intensive farming will call for use of nitrogen fertilizers where none were used before.

Industrial nitrogen needs, particularly for manufacture of synthetic fibers and plastics, will also be heavy.

Issuance of certificates of necessity for additional ammonia capacity to six companies this week was ample evidence that the drive for more ammonia had shifted into high gear. About 225,000 tons per year of new plant capacity will be added by these units to industry total.

In addition, Solvay Process Co. will add 100,000 tons more when it converts its Hopewell, Va. and South Point, Ohio operations from coke-derived synthesis gas to that derived from natural gas. Another boost to the total will come from Morgantown Ordnance Work's 200,000 tons per year capacity which is slated to go on stream soon. The output of several smaller operations will also work to swell the total. Result of all this expansion: 610,000 additional tons of synthetic ammonia per year. Phillips Chemical Co. also has two applications for certificates of necessity pending, one for expansion of its present ammonia plant and another for construction of a new plant.

Skeptics Skeptical: Some observers raised their eyebrows at the end of World War II at statements that the war-doubled ammonia synthesis should be upped even further. But expansion of the civilian economy with the help of sizable exports soon dictated the construction of additional facilities.

What the skeptics had failed to take into account was the great change wrought on American farming practices by a combination of high demand and high crop prices plus the introduction of new high-yield but soil-depleting varieties of many crops. The change to hybrid corn has increased yields by about 20% or better than 80% of the country's corn acreage. Result: land for corn production, which formerly obtained sufficient soil nitrogen from legumes, manure and other natural sources must now rely on high pressure reactors of a synthetic ammonia plant to supply increased soil nitrogen needs.

SECRETARY BRANNAN: An added 100,000 tons will be needed each year.

100,000 Tons: Secretary Brannan of the U. S. Department of Agriculture has stated that the immediate needs are for 500,000 additional tons of nitrogen fertilizer. But this is only the beginning. An additional 100,000 tons will be required in every calendar year thereafter. Some experts can quarrel with Secretary Brannan's figures but it is impossible to quarrel with the fact that large additional quantities of fixed nitrogen will be needed each year for fertilizer. Population is continually expanding and more food must be supplied. And more food will require more nitrogen fertilizer.

Fibers and Plastics: Nitrogen-containing chemical products, although much smaller than fertilizer on a tonnage basis, are also booming. This is particularly true of the polyamide (nylon) and polyacrylonitrile fibers. Not to be forgotten is the great demand for urea-formaldehyde resins to make big ones out off little ones in Plaswood's production of fiberboard by binding wood chips with a urea-formaldehyde resin. But from now on it will be the fertilizer demand rather than need for industrial nitrogen that will provide the major impetus for further nitrogen expansion.

AMMONIA BALANCE SHEET
(M tons/year)

Present Rate of Production	1,750
Morgantown Ordnance Works	200
Mississippi Chemical Co.	35
Seven Certificates (due Spring 1953)	225
Solvay Process Co.	100
Other	50
Total	2,360

Three More: The certificates indicate that the ammonia industry will soon have three more producers, Wyandotte, Diamond and Hooker. Significantly each is a large producer of electrolytic chlorine and presumably these plants are to be installed to utilize cell hydrogen. Despite these expansions, most of the new tonnage will use natural gas as the raw material. Also Solvay's two plants, which now use coke-derived synthesis gas are to be converted to natural gas, leaving only DuPont's Belle, W. Va.

CERTIFICATES OF NECESSITY FOR AMMONIA FACILITIES

Company	Location	Amount	% Eligible
Commercial Solvents Corp.	Sterlington, La.	$20,458,000	50
Diamond Alkali Co.	Houston, Tex.	1,606,000	50
Diamond Alkali Co.	Painesville, Ohio	828,900	70
Hooker Electro-Chemical Co.	Tacoma, Wash.	1,894,700	50
Mathieson Chemical Corp.	Lake Charles, La.	1,388,238	50
Solvay Process Div., Allied Chemical & Dye Corp.	Hopewell, Va. and South Point, Ohio	12,030,000	85*
Spencer Chemical Co.	Vicksburg, Miss.	13,758,000	50
Wyandotte Chemical Corp.	Wyandotte, Mich.	2,624,000	50
	Total	$54,587,838	

* For conversion from use of coke to use of natural gas.

operation as the only ammonia plant based on coke.

Unless major quantities of fixed nitrogen are to be required for explosives' manufacture, Secretary Brannan's goal of an additional 700,000 tons of nitrogen fixation plant should be reached by the end of 1953—and be in use unless a period of low crop prices should intervene. Government support of farm prices, now well-established, will undoubtedly prevent such an occurrence.

The Bombs Came

A sensible sounding rumor is running through official Washington this week to the effect that the Korean Reds are frantically trying to put back in operation three chemical plants that were bombed out early in the current hostilities. The rumor received some impetus by the coincident release of the full details of the effects of the bombing.

The erasure of the plants by U.S. B-29's evidently put quite a big dent in the Reds' war potential . . . and for a good reason. The destroyed installations constituted more than a third of all Korea's industry.

The target plants, which were located at Konan, North Korea, were one of the largest chemical-industrial combinations in all Asia. They consisted of the Chosen Nitrogen Explosives Factory, the Chosen Nitrogen Fertilizer Factory and the Bogun Chemical Factory. It was also revealed that another victim of the year old but still successful bombing was an ore refinery located next to the fertilizer installation.

Before and After: Before the bombs hit, the explosives plant at Konan was a mainstay of the Korean Reds' military machine. It employed 2700 workers and covered an area of about one mile along the east side of the Josen River. Plant operations were housed in 70 manufacturing buildings, about half of which were of light steel frame construction. The Japanese controlled the plant during World War II and pushed its capacity to the utmost. But the plant was still further expanded since 1945 when the North Korean government took it over.

RED KOREA: It's hard to make chemicals in a flattened plant.

Japanese Built: The fertilizer installation at Konan was a large one by any yardstick. It was designed and built by the Japanese in 1931 during the early bloom of their Asiatic ambitions. Under the direction of the Japanese owners, Nippon Chisso Hiryo K.K., the plant enjoyed a steady expansion that carried on right through to the end of World War II. Initial facilities provided for the manufacture of nitric acid and ammonium sulfate but as time went on other chemical staples were added to the plant's output.

The rate of plant expansion under Japanese direction was closely geared to the extent to which the Japs were able to develop hydroelectric power projects in North Korea. They started with a power supply of only 200,000 kw which by the end of the last war had been increased to 1,600,000 kw.

Typical of what this power increase did for the Konan site can be seen from the fact that during the last year of Jap ownership the plant's ammonium sulfate capacity had reached 500,000 metric tons a year. And even as the surrender papers were being signed in Tokyo Bay, the Japs had other power stations a-building that would have furnished an additional 1,300,000 kw for their chemical and metallurgical operations in northern Korea.

Chlorine, Soda Too: Air Force experts also revealed that the third eradicated chemical plant (400 tons of bombs) at Konan had once been the pride of the Japanese chemical industry before World War II. It had been the largest chlorine and electrolytic caustic soda plant under their control and the Korean Red government, after taking it over, continued to operate it at top pitch.

In addition to chlorine and soda, the plant, which employed 7,800, had an annual estimated production capacity of 50,000 metric tons of calcium carbide. In this role it was considered the largest of its type in Asia. Authoritative estimate has it that the

Current List of DPA-Certified Chemical Facilities

COMPANY	LOCATION OF FACILITY	PRODUCT	AMOUNT ELIGIBLE	PERCENT
Union Carbide & Carbon Chemical Co.	Institute, W. Va.	Insecticide	$ 5,874,400	50
Monsanto Chemical Co.	Everett, Mass.	Maleic anhydride	23,800	60
Pittsburgh Plate Glass Co.	Barberton, Ohio	Silica pigment	1,545,801	70
Commercial Solvents Corp.	Sterlington, La.	Anhydrous ammonia	20,458,000	50
Spencer Chemical Co.	Vicksburg, Miss.	Anhydrous ammonia	13,758,000	50
Mathieson Chemical Corp.	Lake Charles, La.	Anhydrous ammonia	1,388,238	50
Hooker Electro-Chemical Co.	Tacoma, Wash.	Anhydrous ammonia	1,894,700	50
Wyandotte Chemical Corp.	Wyandotte, Mich	Anhydrous ammonia	2,624,000	50
Diamond Alkali Co.	Houston, Tex.	Anhydrous ammonia	1,606,000	50
Kaiser Aluminum & Chemical Corp.	Baton Rouge, La.	Alumina	3,528,000	80
Reynolds Metals Co.	Saline County, Ark.	Alumina, synthetic cryolite	12,943	80
Reynolds Jamaica Mines, Ltd.	Jamaica, British West Indies	Bauxite	14,496,209	80
Bethlehem Steel Co.	Bethlehem, Pa.	Metallurgical coke and coal chemicals, pig iron	28,780,000	85
Diamond Alkali Co.	Painesville, Ohio	Anhydrous ammonia	828,900	70

Reds had expanded the plant to about four times its size under Jap ownership.

A Lesson: All told, the flattening of Konan's chemical operations took only 1,582 tons of high explosives. This sharply confirms the observation that one ton of explosives can knock out several tons of crowded plant capacity. It also provides a good argument for plant dispersal to the growing chemical industry in this country.

Part of the Team

After the crippling strike in its Painesville, Ohio, plant last year, Diamond Alkali Co. began checking its chain of industrial relations for the weak link. The company soon found the rusty spot close to home: management and employees out of touch. Now Diamond is watching the success of the first issue, June-July, of its new house publication, *The Diamond Story*, culmination of an entirely revamped internal relations policy.

Like many other companies, Diamond was limping along without a real *company* publication to draw management and labor together as part of the team in their common goals and interests. The single house publication, *Alka-Lines*, was nothing but an employee news magazine serving all 12 widely scattered plants. Bulky and dull, it was completely oblivious to the company as a company. As far as the employees knew from the magazine, Diamond could have been feeding its products to camels.

No attempt was made to show the employee his importance in the overall scheme, the company's position in the community, or the uses and necessity of its products. Management appeared only in impersonal communiques, detached and external to the employees. As a result the employees felt no real part in the company.

Realizing that half-measures are worse than no-measures, C. B. McKnight, assistant director of Public Relations in Diamond's Cleveland offices, laid the cornerstone of the rejuvenated policy with the new magazine, *The Diamond Story*. Appearing six times a year, it is a 20 page slick paper magazine, with four color cover, and highly attractive layout.

Team Member: A man works best when he feels part of the company and knows what his work means in the larger picture. McKnight uses the new magazine to tell what the company is doing, what its products are used for, who uses them, and why.

The first issue jumped off on the right foot with an article by Diamond's President Raymond F. Evans on 'How Diamond Is Doing." This type article shows an employee he is important enough to know what is going on, and makes him feel that he wants to know what *his* company is doing. It brings the president into the shop as a partner rather than a demigod somewhere in space.

Second shot of blood in the industrial relations set-up came with the complete re-vamping of *Alka-Lines*. Changed from the massive monthly that tried to be interesting and newsworthy to all plants at once, (and was consequently of little interest to any single plant), to a bi-weekly tabloid newspaper for the Painesville plant alone, *Alka-Lines* has taken on new life.

In a breezy style, lavishly illustrated, with all content aimed at the single plant, the paper is now both interesting, and a part of life at Painesville. On the theory that a successful family-type employee paper must concentrate on a small area—a paper for each plant is ideal—*Alka-Lines* is now a strong link in industrial relations policy.

The new two-pronged program of publications—*The Diamond Story* to knit management and employees into their proper company "team," and the revived *Alka-Lines* to make a family in the Painesville plant—has proven highly successful and should give much food for thought to other companies in the same boat Diamond was.

BUSINESS INQUIRY CENTER: Washington's first aid for frazzled businessmen.

Merry-Go-Round Slows Down

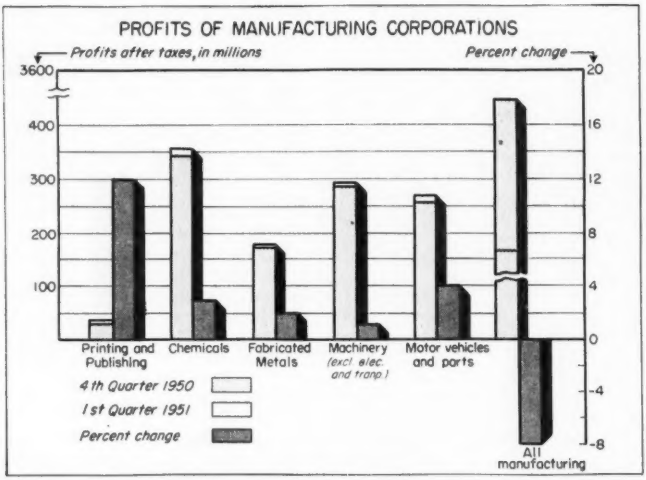
The infamous "Washington Merry-Go-Round" is becoming a clear track these days, as a result of the new Business Inquiry Center. With so many businessmen tied up in NPA, DPA, and other government dealings, some answer to the time waste of heel-cooling and office-to-office shuttling had to be found.

Since its establishment on May 1, the Center has expedited 28,694 visitors and 22,580 telephone inquiries. Questions that kicked around Washington for days and even months are normally answered in from five minutes to eight hours.

Main aid to harried businessmen is the Business Inquiry Unit. In its one room, moving from specialist to specialist, small and large businessmen, at the rate of 100 a day, are obtaining the exact information they need without the customary office-hopping. Whether they want to build a $10,000,000 chlorine plant, a gas station, or a swimming pool, there is a specialist ready for them.

The unit is particularly useful for long-distance calls. After 27 harrowing minutes on the line, a West Coast manufacturer was finally referred to the unit, got his data in five minutes.

A Distribution Unit, handling 500 callers a day, passes out copies of all free NPA and DPA literature. A Reception Unit, processing 1,500 a day, fills the vital function of telling just who to see and where to write. This unit alone is a bonanza to businessmen with little time to waste.



SWIMMING UPSTREAM: First quarter profits for the chemical industry ran counter to the general downward trend as shown by the recent SEC survey of sales and income. One of five groups to show a gain over the fourth quarter of 1950, the chemical industry showed a 3% increase in net income; all manufacturing industry lost 8%. One reason for the general decline was the excess profits tax, but it was not the whole story. Record sales were accompanied by high cost of raw material and operating expenses. As a result, pre-tax profits for all manufacturing industry were 6% lower; chemical profits, before taxes, 6% higher.

Fences Razed

From Attorney General McGrath comes the word that the six-year court dispute between the government and Permutit Co. has come to an amicable conclusion with the entry of an anti-trust consent judgment against Permutit and its board chairman, W. Spencer Robertson. Affecting the company's licensing of patents in this country as well as its trademarks abroad, the judgment could have repercussions among users of ion-exchange materials and water-purification equipment.

From some aspects, the Permutit case parallels the recent decision concerning Timken Roller Bearing (*CW, July 7*). But there is one big difference: Timken, together with an English businessman, owned 54% of the British firm, all of the French one. Permutit, however, despite a similarity in names, has no financial interest in the companies named as co-conspirators.

Territories: The judgment brings to an end agreements made between Permutit and the European firms. Under the terms of the agreements, Permutit was not free to sell its wares in certain world areas, the Europeans could not market their goods in others.

Now Permutit will carry on its advertising, promotion, foreign trademark registration and packaging so that its products can enter any foreign markets. Since three of the seven co-conspirators use the word, Permutit, in their names, the company will have to adopt—for foreign trade purposes—a trademark that won't be confused with any foreign company operating in the area.

Patents: Through the consent judgment, Permutit has also agreed to grant royalty-free licenses on ten of its patents, non-discriminatory reasonable-royalty licenses on another 125. Applicants can get the license either directly from the company or from the Office of Alien Property.

McGRATH: No royalties now.

No Change: According to Permutit, the judgment will not have too much of an impact on its way of doing business. "It merely means," says management, "that we will not exchange experiences and ideas with the foreign companies as we have in the past. We will be operating in some new markets, some of the foreign concerns will now be operating in this country."

The company adds that a Permutit patent is not a surefire method for getting rich quick. Some of the patents were taken out on developments that have no immediate commercial potential. Furthermore, always willing to grant licenses to any financially responsible party, it has never been deluged with requests. Here again there is a difference, though. It has never been willing to grant them on a royalty-free basis.

Cleaner Sound

Some real progress in pollution control is being made in the Puget Sound area of Washington. According to a recent report by E. F. Eldridge, Director of the Washington State Pollution Control Commission, Puget Sound is considerably freer of pollution than it was only three years ago. And credit, said Eldridge, is due to the many chemical process companies and communities who cooperated.

If pollution had been allowed to continue unchecked it might have destroyed the Sound's $25 million fishing industry as well as the multimillion-dollar sportsmen's fishing and recreation industries that live in the area.

Industry Help: Many companies joined hands with state officials however, and the drive to cut pollution was on. Rayonier Inc., for instance, began to impound sulfite waste liquor that virtually had destroyed the native oyster industry at Shelton and Soundview, Washington. Weyerhaeuser Timber Company, built a $600,000 pipeline at Everett, Wash., which carries waste pulp liquor, harmful to salmon trying to migrate for spawning, far out into the bay. Weyerhaeuser is also studying elimination of sulfite wastes by extracting pulp with triethylene glycol (*CIW, May 5*).

Another instance of industry cooperation, commended by Eldridge, is the case of Boeing Airplane Co.'s plant, which now treats its cyanide wastes formerly dumped into the

"KARBATE" BRAND IMPERVIOUS GRAPHITE HEAT EXCHANGERS *FOR ALL PURPOSES!*

The "Karbate" impervious graphite heat exchangers illustrated are used extensively as boilers, coolers, condensers, vaporizers, evaporators, heaters and absorbers in handling corrosive chemicals, either hot or cold. They *all* can be had in a complete size range. *All of them* offer the following advantages:

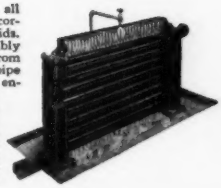
- **Highest heat conductivity rate of the practical corrosion-resistant materials.**
- **Highly resistant to corrosion by acids or alkalis, hot or cold.**
- **Freedom from corrosion scale, as compared to metals.**
- **Immune to thermal shock.**
- **No contamination of product.**
- **Strong and easy to install and maintain.**

Shell-and-Tube: Series 70A—Two sizes, 16.4 sq. ft., and 24.6 sq. ft. of outside surface area respectively. Tubes easily replaced in the field. Interchangeable single and double-pass construction.

Style FH heat exchangers (Size 1½): Are especially recommended for tanks with solution depths of 16 inches or less. Write for catalog section S-6750.

Series 240A—70.6 feet of outside heat transfer surface. Easy tube replacement. Easily converted on job to single, double, or four-pass tube side flow by simple change of fixed covers. Steel, shell, oversize shell connections, impingement plates and drain and vent plugs integral with shell end castings. Stainless-steel baffles assembled with steel tie rods to form protective cage for tube bundle. Removable "Karbate" tube bundle. Write for catalog sections for S-6690, S-6715 for details of applications, maintenance, sizes and characteristics of these exchangers.

Cascade coolers: For all cooling jobs involving corrosive gases and liquids. Complete cooler assembly may be made quickly from 4 standard items in 5 pipe sizes. Capacity easily enlarged or reduced by adding or subtracting standard sections. Compact construction to save plant room. No special supporting structure needed. Write for catalog section S-6780.



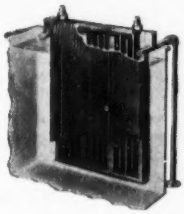
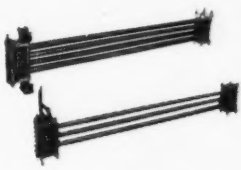


Plate heaters: Used to heat or cool corrosive liquids in tanks and vessels. Compact, completely assembled, easy to put in. Used in pickling, etching, plating and cleaning tanks. Complete size range. Models for horizontal and vertical mounting. Write for catalog section S-6620.



Concentric Tube exchangers: Available in two types. Series 10A is small, low-priced, gives true counterflow. Exceptionally good for small flow rates at narrow temperature differences . . . Series 20A manufactured with "Karbate" inner and outer piping, and is used to transfer heat between two corrosive fluids. Both have sectional construction, can be added to or subtracted from at will. Sturdy, can be moved from place to place after assembly, adapted to any method of mounting on floor, wall, or ceiling. Write for catalog section S-6670.

The term "Karbate" is a registered trade-mark of Union Carbide and Carbon Corporation

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Duwamish River (*CIW, Mar. 24*).

Community cooperation in this fight on pollution took the form of 17 sewage treatment plants which were erected by as many communities along the shores of Puget Sound. Cost: $2.1 million. An additional $2 million's worth of plants are now under construction in other communities in the area. Evidently community-industry cooperation can be made to pay off in the fight against murky waters.

Hormone Debate

Diethyl stilbestrol is a blessing or a curse to the poultry-eating public—take your choice. Even the experts are split, but this week the debate was brought into sharp focus by the news that $10,000-worth of poultry had been ruined by improper use of the chemical as a caponizing agent.

The greatest part of diethyl stilbestrol production is used by poultry farmers to caponize cockerels. Because of its estrogenic properties, the chemical is almost ideal for this job. A tablet, implanted in the neck of a young chick, is slowly absorbed converting the bird to a more tender specimen.

Scarcely soluble in water, the stilbestrol tablet remains in the bird's neck until it is butchered. In fact, only about half of the tablet is usually absorbed. When the bird is slaughtered, the head and portion of the neck containing the tablet are discarded. The Food and Drug Administration has given its blessing to this procedure, but recently has had cause to reconsider.

Heads, along with other poultry offal, are recommended fare for ranch mink. Much to their dismay, mink ranchers at times noted a marked lack of breeding activity in their furry charges. They put the finger on diethyl stilbestrol and raised a howl that eventually was heard in Congress.

Enter Delaney: The Delaney Committee latched on to the case of the reluctant mink and soon had diethyl stilbestrol on the investigational spot. Object: To determine whether chemical caponizing was inimical to the public health. Physiologists, zoologists, endocrinologists, and physicians testified; when the smoke cleared, the issue was still up in the air.

Testimony centered about the following questions: Was diethyl stilbestrol responsible for mink breeding failures? Is the chemical ingested by persons who eat chemically caponized poultry and in what amount? Is this amount of ingested stilbestrol enough to do physiological damage?

Because of a surprising lack of conclusive research on these questions, the witnesses for the most part refused to go out on a limb. Nevertheless, some very interesting—and in some cases conflicting—statements were made. It was generally conceded that half a stilbestrol pellet (about 7½ mg) could easily cause temporary sterility in small animals like mink. But it was also shown that some mink breeding failures occurred on a normal poultry diet. On the other hand, normal production of mink kits was observed after ingestion of as much as 21.5 mg of stilbestrol.

On the question of residual stilbestrol in the marketable portion of the hormonized bird, S. A. Asdell, Professor of Animal Physiology at the N.Y. State College of Agriculture, opined that it would probably be of the order of 0.01 mg or less, in 100g of muscle tissue. According to Asdell, "The upper limit of fresh flesh eaten at a meal is probably about 8 ounces, or 200g. Using this estimate as a basis, the amount of estrogen ingested is not likely to be above 0.02 mg per day. . . . I do not believe that it will produce untoward effects."

Another Twist: But Robert K. Enders, Professor of Zoology at Swarthmore College, has another twist to the story. He cites experimental work indicating that treated birds contain enough drug to cause changes in the human reproductive tract. Moreover, Enders says, "Because of the nature of the drug is concentrated in the liver and fat [of hormonized poultry]. . . . We all know that chickens are cut up for sale so one can buy livers alone if he chooses. In this way the consumer is getting more stilbestrol to ingest than in any other way."

The long-term effect of small doses of stilbestrol was another item of consideration. Asdell said, "So far as I am aware, the effects of low doses, of the order that may be found in treated poultry, have not been tested over a long period of time." But Enders testified, ". . . the drug is used in medicine . . . large doses have been given patients without disaster. . . . Yet the literature shows that extremely minute doses can effectively sterilize and injure laboratory animals where larger doses have no long range effect."

Examination of a sample of hormonized chickens on the market led Enders to believe that about 16% show evidence of diethyl stilbestrol implantation in marketed portions of the bird, rather than at the base of the skull. This highlighted the possibility of accidental ingestion of half a stilbestrol pellet (about 7.5 mg). Endocrinologist Greenblatt reported that this dosage must be considered large compared to ordinary clinical use. Physiologist Asdell believed a dose of this size would have only transient

GLASS-LINED HOOD: Secret to the successful operation of a new hood—just installed by Pratt & Whitney at its chemical analysis lab—is a water spray in the exhaust system. It traps acid fumes, also keeps interior piping free of deposit. The glass lining was necessitated by the danger of absorption of perchlorates by conventional hood linings. Earlier efforts to glass-line the hood required frequent cleaning of the hood and were generally unsatisfactory. P. & W. says the hood is the only one of its kind, hopes it may lead to similar hoods in other chemical labs.

physiological effect; no permanent harm would be done.

However the FDA in New York was worried enough, over the possibility of accidental ingestion, to obtain a seizure order for 27,000 pounds of imperfectly treated poultry.

Like their testimony, the expert's conclusions were far from unanimous. T. C. Byerly, Chief of the USDA's Animal Husbandry Div., gave the opinion that poultry caponizing with stilbestrol was not hazardous to the public and reaffirmed his faith in the FDA approval of this practice by the poultry industry. But zoologist Enders countered with, "I believe that it is against the public interest to permit the use of any hormone or hormone-like drug in the fattening of animals. . . ."

No Bed of Roses: Stilbestrol producers are calm in the face of the Delaney investigation. One prominent manufacturer believes the FDA is on safe ground and has no reason to reverse itself on the basis of testimony given before the Delaney Committee. At first glance it would appear that industry is taking the narrow view. But stilbestrol manufacture is no bed of roses; and last year's total market for poultry purposes only amounted to 450 kg.

The compound is easy enough to make, but the safety problem is a real headache. Chief manufacturing process is the anisic aldehyde procedure. At one time, this process required an autoclaving step which cut down the yield and was a health hazard to workers emptying the autoclave. Although the autoclave has since been eliminated, personnel safety is still a ticklish consideration.

A recent $1 million damage suit charging the Primorganic Chemical Co. (as codefendant) with negligence in providing proper safeguards to stilbestrol overexposure, is a dramatic illustration of production perils.

S. B. Penick and Co. started stilbestrol manufacture in this country about ten years ago. As pharmaceutical and agricultural demand for the product grew the roster of manufacturers increased. Many small concerns, ill equipped for stilbestrol production, got into the business only to be forced out by a string of safety mishaps. Today, stilbestrol-producing companies can be counted on the fingers.

Producers are now sitting tight, awaiting developments on the Washington scene. An adverse decision may not break many hearts. At least one manufacturer has admitted that he is now producing only to keep the good will of his customers.

FIBERGLAS' L. H. LUDEMAN (left): Colors for glass fibers open a new market.

Fiberglas—Now Colors

One of the main drawbacks to the widespread use of fabrics made from glass fibers has been their resistance to dyes. Now a new process developed jointly by General Dyestuffs, General Aniline & Film and Owens-Corning Fiberglas allows dyeing of bright colors without the previous drawback of decreasing flame resistance.

The process, known as Appretan PF, makes use of a resin coating for fibers, which in turn, will adsorb dyes. In addition to permitting a rich and intense color, the process allows production of piece goods with silk-like softness and drape.

First use for the process was in the application of dyes by screen printing. Piece dyeing methods have now come out of the laboratory and into the pilot plant stage.

Military uses for the fireproof fabrics will come first. One of Fiberglas' first customers is the Navy, for which it is producing a silver gray fabric for porthole and portiere curtains.

These uses for present production are far too great to leave anything for retail sales, though these will undoubtedly be pushed when yarns are available. Glass fiber marquisette curtains in pastel shades, on the other hand, are now available in retail stores. These curtains are included in Fiberglas' overall dyed fabric production estimated by Fiberglas' Louis H. Ludeman, assistant manager of the Decorative Textile Division, at about 300,000 yds./mo.

Need for Dye Process: Persons with only superficial knowledge of glass fibers might think that colored fabrics could be produced by starting with colored glass. Unfortunately, the deepest cobalt glass, for example, produces a fabric of light blue.

Dyes would be needed, it was determined, to reach the ultimate market for colored goods, so experimenting began in earnest. Resin coatings for fibers were developed to which pigment colors could be attached. In most cases, though, the fabrics were too stiff and lacked essential draping qualities. This was overcome by a heat cleaning process.

Then different types of dye-adsorbing resins were tested by General Aniline. Finally, they set on a resin produced by the cross linking of methyl vinyl ether-maleic anhydride copolymer and polyvinyl alcohol.

Dyes with light and wash fastness were developed which could be adsorbed by the Appretan PF resin. Researchers also found that this resin could act as a binder for other film forming materials such as Teflon, which has been found to increase abrasion resistance without impairing the draping qualities of the fabric.

Future Outlook: Output of glass fibers has skyrocketed during the past few years because of the many uses found where dyeing is of little importance.

The new dyeing process will make possible an even greater expansion of the glass fiber industry since it opens up a new market with whopping potentialities.

MILITARY PROCURERS: Facts fall short of theory.

Not Enough Time

Government efforts to placate the small business man are not panning out. The principal reason is that, although the policies look good on paper, they never get down to the offices that are actually responsible for the purchasing.

A few weeks ago, for instance, the Munitions Board embarked on a campaign to give businessmen 18 days' advance notice on all bids for procurement, full publicity to all unclassified, negotiated contracts.

But the July 6 issue of the consolidated synopsis of bids and awards, issued by the Department of Commerce, carried bids closing July 17. Since the information is not available at field offices for most businessmen until three days after the date of issue, it meant they had only 8 days in which to place their bids in the proper procurement office.

In the same issue, requests from the Veterans Administration were listed for pharmaceuticals and glass funnels. Closing date: July 3.

Why: This week, to find a reason for this discrepancy between policy and practice, CHEMICAL WEEK queried Munitions Board officials. They frankly admit they have no means of enforcing the policy on advance notice, nor a method for assuring full publicity on negotiated contracts.

Furthermore, they have no standard procedure for getting in touch with firms on negotiated contracts. "It's all up to the individual service to set up its own system," they say.

What: That leads to the question: What steps are the services taking to conform with over-all Federal policies on purchasing? A spot check reveals that, because of different purchasing objectives, it is possible for methods to vary from office to office—within the same service.

In the Chemical Corps, for example, it is not possible to put down the same set of rules for the Atlanta office and the Edgewood office. Atlanta is doing no actual purchasing, just procurement planning. Edgewood on the other hand, does a lot of purchasing, but little in the unclassified field. As far as advance notice on advertised contracts is concerned, the 18 days' leeway has been standing operating procedure for some time.

How: All of which does not make the businessman's lot any easier. Nor does it answer his question of how to go about getting more defense contracts. The best answer to that is to keep in touch with Federal policies, individual offices where possible, and to keep hoping for a simplified system of uniform Government procurement.

KEY CHANGES . . .

J. W. Stevens: From director of sales, Organic Chemicals Dept., to sales manager, Chemical Division, Celanese Corp.

R. H. Kampschulte: From sales manager, Eastern Ditrict, to assistant sales manager, Chemicals Division, Celanese Corp.

C. K. Banks: From director of research to vice president, research, Metal & Thermit Corp.

M. A. Connor: To vice president, National Aniline Division, Allied Chemical & Dye.

H. J. Daigneault: To vice president, National Aniline Division, Allied Chemical & Dye.

Raymond C. Gaugler: To vice president, Manufacturing Chemists Assn.

H. O. C. Ingraham: To executive committee, Manufacturing Chemists Assn.

H. W. Fisher: To executive committee, Manufacturing Chemists Assn.

F. N. Williams: To executive committee, Manufacturing Chemists Assn.

Walter G. Whitman: From head of chemical engineering department, MIT, to chairman, Research and Development Board, Defense Department.

W. Ward Jackson: From sales manager, Chemical Division, Celanese Corp., to general manager, Industrial Chemicals Division, Commercial Solvents.

Pierre S. du Pont, 3rd: To assistant director of sales, Rubber Chemicals Division, Organic Chemicals Department, Du Pont.

Russell J. Wolf: From assistant to the president, to vice president, sales, M. W. Kellogg.

Donald W. Champlin: To vice president, manufacturing, M. W. Kellogg.

W. R. Kulow: To assistant sales manager, Phosphates Division, Westvaco Chemical Division.

H. D. Robinson: To assistant manager, Alkali Division, Westvaco Chemical Division.

EXPANSION . . .

American Cyanamid: North American Cyanamid Ltd. (subsidiary of American Cyanamid) will spend $4 million to increase the output of its Ontario plants (Niagara Falls and Welland). The expansion program will involve installing furnaces, liquid air equipment, ovens and other facilities to boost production of calcium cyanamide at Niagara Falls and dicyandiamide at Welland.

•

Du Pont: Expansion of neoprene facilities at Louisville will increase capacity by 30%. A certificate of necessity has been granted (*CW, July 21*) allowing a 70% rapid write-off on $7,015,000. Program is expected to be completed by December of this year.

•

Durez Plastics: The company has applied for a certificate of necessity on a $6½ million expansion project. DPA says the application was filed some time ago, action is still pending on it. Company sources are close-mouthed about either the nature or the location of the proposed expansion.

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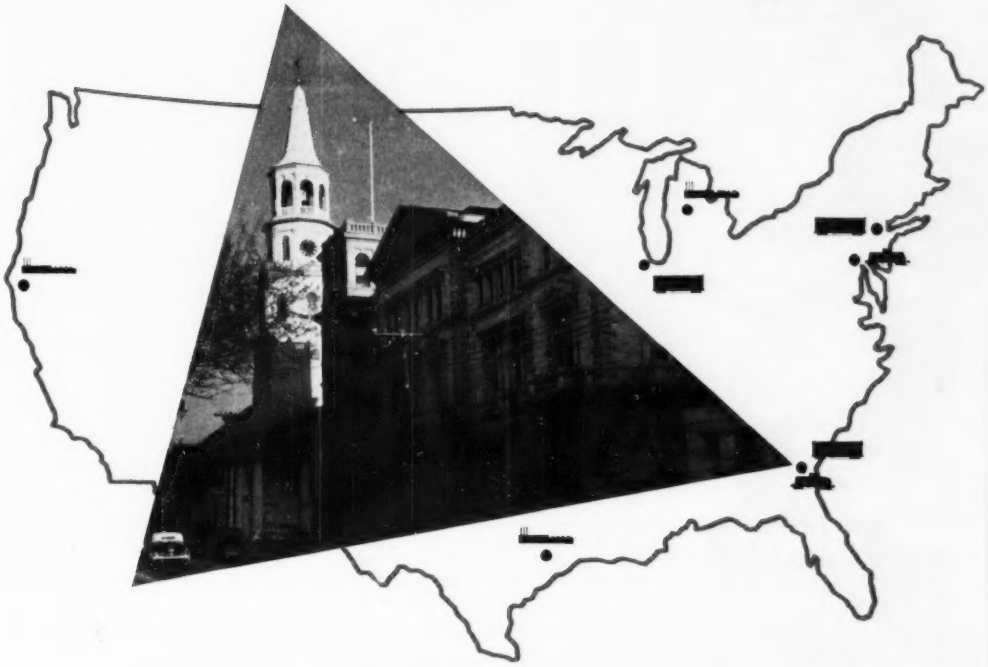

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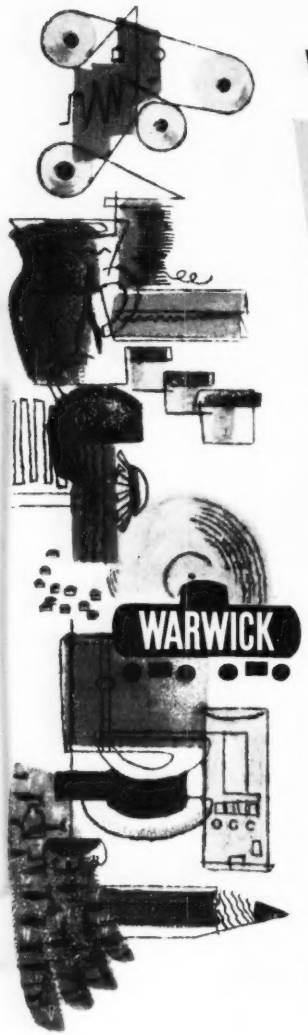

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MEKON® B-20 A-20 Y-20	190-195 190-195 190-195	3-5 3-5 3-5	BROWN-BLACK AMBER-6 MAX. YELLOW-3-3½	0.0	0.0	MICRO-CRYSTALLINE HARD BRITTLE
CARDIS® 314	184-189	4-6	4-5	13-15	45-50	EMULSIFIABLE PETROLEUM WAX
CARDIS® 319	180-185	5-7	4½-6	18-20	65-70	EMULSIFIABLE PETROLEUM WAX
CARDIS® 320	180-185	5-7	4-5	30-32	80-85	EMULSIFIABLE PETROLEUM WAX
CARDIS® 262	195-200	4-6	BROWN	14-16	40-45	SPECIALLY PROCESSED PETROLEUM WAX
FORTEX®	190-200	3-5	2½-3½	0.0	0.0	MICRO-CRYSTALLINE HARD AND PLASTIC
SUGAR CANE WAX 500	174-178	2 MAX.	TAN	23-28	65-77	VEGETABLE WAX
WARCO® WAX 150	145-150	20-25	BROWN YELLOW	0.0	0.0	MICRO CRYSTALLINE PLASTIC
PARAFFIN	131-133	FULLY REFINED				CRYSTALLINE

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PACKAGING . . .

DEGREASING TESTS: Of added interest to the chemical industry.

Army Package Probe

Equipment now being installed at the Package Development Laboratory (part of the Engineers Research and Development Laboratories at Ft. Belvoir, Va.) is another step forward for the lab in its quest for improved package design by measuring package performance. Industry's dividend from the work is a significant reduction in material loss through faulty packaging.

The new equipment is an electronic recorder—designed by ERDL engineers and built under contract by a private concern. It will be used in conjunction with the package laboratory's testing machines to provide an answer to researchers' questions. They can already decide whether or not a package is adequate for a given set of conditions; the recorder will tell them when and why the package fails.

Up-To-Date: The lab has the most modern container testing equipment in the country. Some of its mechanical testers: vibrators to provide vertical accelerations that the package might encounter in transit; a hexagonal revolving drum to determine its ability to stand up under rough handling; and in incline-impact tester to measure resistance to stress.

In addition, the lab has facilities for finding out how a package withstands corrosion or fungi. (This phase of the work is of added interest to the chemical industry since it evaluates cleaning solvents, preservatives, and other chemicals involved.)

The lab can duplicate almost any conceivable climatic condition – extreme heat and cold, rain, snow or dust storms. And even though it can simulate many conditions met in the field, it is now shipping a number of items to various points in the world for storage in the open.

Progress: Work done at the lab (and similar labs throughout the country) played a vital role in the country's shipping operations during World War II. It has been estimated that during the early years of the war, only 45% of all the material shipped overseas arrived in a usable condition. By 1945, the figure was reduced to 25%.

But James A. Sargeant (Chief, ERDL) and his associates aren't at all satisfied with the 25% loss. To Sargeant, it simply doesn't make sense for the country to keep pushing for capacity production and then to lose a good portion of it through improper packing. He expects that soon the loss will amount to less than 5%.

Now: The lab will continue to be a key factor in the defense economy. It is working in cooperation with government bureaus (including the Military Department's Packaging Board and the Central Munition Board's Packaging Board), also maintains a close contact with industry. Its findings form the basis for joint Army-Navy packaging specifications.

Sargeant says the lab's findings have been responsible for many of the packaging procedures that are now standard practice with industry. Furthermore, he says that research there has encouraged a lot of industrial research along similar lines.

SUBMERSION: Tank gives clue to performance of protective coatings.

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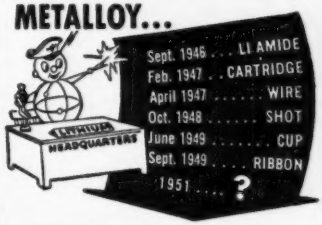
Sept. 1946 . . . LI AMIDE
Feb. 1947 . . CARTRIDGE
April 1947 . . . . . WIRE
Oct. 1948 . . . . . SHOT
June 1949 . . . . . CUP
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Chemical Formula	$Na_5P_3O_{10}$ (Anhyd.)	$Na_4P_2O_7$ (Anhyd.)
Typical Analysis	Phosphorus Pentoxide (P_2O_5).....57.5% Sulfates (SO_3).....07% Fluorine (F).....5 ppm* Arsenic (As_2O_3).....0.1 ppm* Lead (Pb).....0.4 ppm*	Phosphorus Pentoxide (P_2O_5).....53.1% Sulfates (SO_3).....07% Fluorine (F).....5 ppm* Arsenic (As_2O_3).....0.1 ppm* Lead (Pb).....0.4 ppm* *Parts per million
Types Available	Powdered and Granular	Powdered and Granular
pH — 1% Sol.	9.7	10.2
Solubility in 100 Parts of Water	25° C.—14.5 pts. 80° C.—23.25 pts. 40° C.—16.25 pts. 100° C.—32.5 pts. 60° C.—19.25 pts.	25° C.—6.0 pts. 80° C.—41.1 pts. 50° C.—16.5 pts. 95° C.—29.0 pts. 75° C.—46.0 pts.
Water Softening Efficiency—percentage of phosphate on weight of water required to secure zero hardness toward soap. Test waters contained 2 to 1 ratio of calcium to magnesium hardness.	Hardness PPM: 50 / 100 / 200 / 300 / 400 / 500 Room Temp.: 0.05% / 0.11 / 0.20 / 0.30 / 0.39 / 0.50 140° F.: 0.05% / 0.11 / 0.18 / 0.27 / 0.33 / 0.48 180° F.: 0.05% / 0.09 / 0.15 / 0.21 / 0.27 / 0.33 Sodium Tripolyphosphate solubilizes both calcium and magnesium soaps.	Hardness PPM: 50 / 100 / 200 / 300 / 400 / 500 Room Temp: 0.21% / 0.38 / 0.56 / 0.66 / 0.75 / 0.88 140° F.: 0.21% / 0.30 / 0.45 / 0.55 / 0.69 / 0.75 180° F.: 0.21% / 0.26 / 0.38 / 0.54 / 0.69 / 0.75 Tetrasodium Pyrophosphate solubilizes magnesium soaps and disperses calcium soaps.
Stability to Reversion in Hot Water Solutions. (Both products are stable for months in solution at room temperature.)	After 10 hours at 160° F. solution will contain approximately 98% STPP (unchanged), 1.2% pyrophosphate, and 0.8% orthophosphate. After 2 hours at 212° F. (boiling) solution will contain approximately 80% STPP, 12% pyrophosphate, and 8% orthophosphate.	After 10 hours at 160° F.—practically no hydrolysis—solution still contains approximately 100% of original concentration of TSPP. After 2 hours boiling—99% TSPP, 1% orthophosphate. After 20 hours boiling—90% TSPP, 10% orthophosphate.
Peptizing and Dispersing of Solid Particles.	Both products are very effective, the choice depending on nature of solid particles to be dispersed.	
Prevention of Iron Stains	These phosphates hold iron in solution, preventing stains due to rusty pipes, equipment, or natural iron in water.	
Uses	Water softening. Builder for detergents and soaps—including bar and chip soap (non-blooming). Industrial cleaners. Dispersant for pitch control in paper manufacture. Clay dispersing. Textile processing. Conditioning drilling muds.	Water softening. Builder for soaps and detergents. Conditioning drilling muds. Industrial cleaners subjected to high temperatures for long periods. Stabilizing peroxide bleach baths. Clay dispersing. Textile processing. De-inking newsprint. Tin plating.

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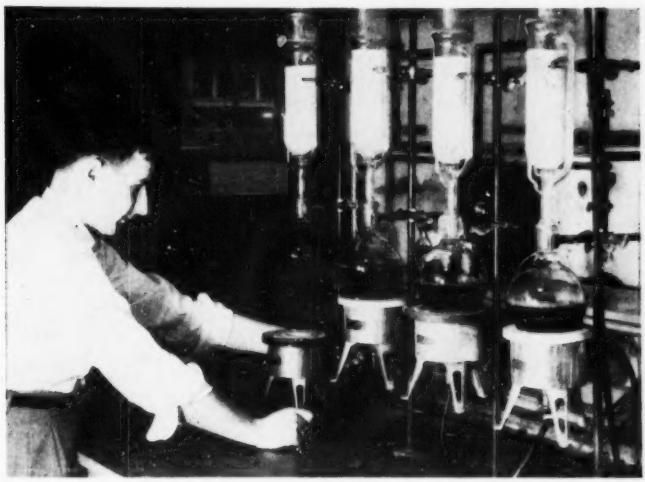


ED CLAPPERTON: A chemical bonus in larch steepwater.

Wood Gum vs. Arabic

Arabogalactan, newest wood-derived chemical product, looks like a potential replacement for gum arabic.

Large-scale extraction procedures have been worked out by Western Pine Association researchers.

But commercial production hinges on market acceptance.

A new chemical marks the latest step in the lumber industry's campaign for total utilization of forest yield. The chemical is arabogalactan—a complex galactose-containing polysaccharide. The source: waste from the milling of Western Larch trees.

Arabogalactan in larch wood is no new discovery, but it took the Western Pine Association to realize its possibilities. Now, after more than a year's work, researcher Ed Clapperton of the Association's Portland, Ore., laboratory has come up with a practical method of extraction.

A water-soluble gum, arabogalactan resembles gum arabic in many respects. Western Pine Association chemists are confident that their creation can serve as a domestic replacement for the Middle East product. In addition, the substance is a good source of galactose and has further possibilities as an intermediate.

Steeped Sawdust: Production of the new gum is by way of a steeping process. Mill waste in the form of larch chips is ground into sawdust and soaked in water at 60 C for two hours; the water extract is filtered off and used to leach three additional batches of sawdust. All four batches of sawdust are then reextracted with fresh water.

The two water extracts are combined and concentrated under reduced pressure to a 12% arabogalactan solution which is filtered and run into more than twice its volume of rapidly stirred ethyl alcohol.

At this stage, the arabogalactan settles out as a white (or light tan) amorphous precipitate; it's filtered, washed with fresh alcohol and low-boiling petroleum ether, dried at 60 C in a vacuum oven. Anywhere between 7 and 17% crude arabogalactan—based on the oven-dry weight of wood—is obtained by this process.

The ratio of steepwater to larch sawdust is an important process variable. A 6:1 ratio works out best, gives an average yield of 11%, keeps liquid volume to a minimum for evaporation and concentration.

If arabogalactan finds a commercial niche, mill owners will be in an enviable position. They should find it relatively easy to produce in sizable volume at reasonable cost. Of course the prospects are entirely dependent upon consumer reaction to the wood-derived compound.

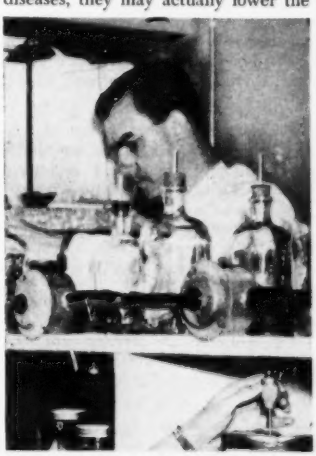
The Western Pine Association, wise to the techniques of market development, is now supplying research quantities of arabogalactan for trade evaluation. The neophyte won't have an easy time bucking gum arabic. Long-entrenched in well-established markets, 15¢-per-pound gum arabic will be hard to displace.

Hormone Armorer

Canadian pharmaceutical firm, Frank W. Horner, Ltd. is now producing STH, a hormone derived from beef pituitary glands. Called Somatrofin, the substance increases the body's resistance to infection, is now being evaluated in the treatment of tuberculosis and various other diseases.

Reviewing progress made to date, Dr. Leonard Mitchell, Horner research director, noted that the hormone first drew attention several years ago as a growth stimulant when it produced giant laboratory animals. This application turned out to be little more than a curiosity as STH was disappointing in efforts to increase the size of dwarfs and stunted children.

The drug was shelved until recently when its protective action against infection came to light. In this respect, the new hormone differs sharply from ACTH and cortisone. Although ACTH and cortisone produce striking beneficial results in many inflammatory diseases, they may actually lower the



LEONARD MITCHELL: Dwarfs stayed small.

body's resistance to infection. This tendency may be prevented or reversed by STH.

T.B. Hope: STH is now undergoing intensive scrutiny to determine its value in tuberculosis therapy. In addition, there is a good deal of interest in the substance in military surgery, because of its pontentialities as a wound-healing factor.

Production of STH is complicated by the same pitfalls encountered in the extraction of ACTH. Both are dependent on beef slaughter; it takes about 10,000 pituitary glands to yield a single ounce of the hormone. Horner's Somatrofin is now supplied to researchers without charge. But, like ACTH, it will be extremely costly if it finds a place in medicine.

Steroid Switch

For the first time in chemical history, a natural steroid has been produced in the laboratory. A Harvard research group, headed up by Robert B. Woodward, has just synthesized cholesterol.

This acomplishment, the successful end-result of efforts to convert the first totally synthetic steroid to a natural form, is another step on the road to production of important steroid substances (hormones, etc.) from abundant organic chemicals.

Earlier this year *(CW, May 5, 1951)*, Woodward reported the synthesis of methyl-3-ketoetioallocholante from *o*-toluidine. Now he has been able to change this first man-made steroid to cholesterol. The odds are definitely against a conversion of this type. Not only does it involve getting the right structure, but also the proper spatial arrangement—and cholesterol is but one of 256 stereo-isomers.

Cholesterol itself has previously been converted to a number of interesting compounds; Vitamin D_3 is probably the most important.

•

Cranberry Chemical: Recent discovery at the Universities of Connecticut and Wisconsin may aid cranberry growers. Ursolic acid can be extracted from the berry's skin, has a market in cosmetics and pharmaceuticals.

•

Pseudo-Curare: British chemists have synthesized a new curare-like agent which they call Decamethonium. The drug will soon be released in this country by Burroughs-Wellcome under the trade name Syncurine.

•

Glass Conductor: Corning Glass Works has patented (U.S. 2,556,616) a novel method for making an electrically conducting glass. A submicroscopically porous glass is impregnated with a saccharide solution, solvent dried out, and the glass fired-up to at least 1200 C in a non-oxidizing atmosphere. This treatment carbonizes the sugar within the pores of the glass; at least 4% of the finished product is contained carbon.

•

Soil Saving: Ohio State University Research Foundation is probing the chemical approach to soil conservation. A project, headed up by Louis J. Goodman of the University's Department of Civil Engineering, is hot on the trail of soil-binding chemicals to resist water erosion. In the laboratory, chemical treatment reduced the damaging effects of rainfall by 95%; field trials are now under way. Navy's Bureau of Yards and Docks sponsors the work.

•

New Drug: E. R. Squibb & Sons has come out with the first hexamethonium compound for the American pharmaceutical market. The drug, called Bistrium Bromide, is useful in the treatment of peripheral vascular diseases and cases of severely elevated blood pressure. Commonly called hexamethonium, the drug may be described as hexamethylene-bis(trimethylammonium) bromide.

•

Nuclear Clean-Up: Solvay Sales Division of Allied Chemical & Dye Corp. is priming its Nytron synthetic detergent for service in decontaminating painted surfaces in nuclear research laboratories.

•

Grease Check: National Bureau of Standards has come up with an accurate, time-saving procedure for determining grease in leather. Time is more than halved by using a three-gram leather sample instead of the usual ten. Key: small, modified Soxhlet apparatus of the type used in rubber extraction.

•

Scented Killer: Discovery that garlic and onion vapors are bactericidal spurred researchers of the Warner Institute to prepare and test the activity of more than 100 organic thiocyanates. Results: Allyl isothiocyanate, principal vapor ingredient, is effective against a number of disease causing fungi; gamma(p-bromo)phenoxypropyl thiocyanate showed highest order of fungicidal activity in comparative tests.

•

Imine Flash: Flash distillation boosts yields of ethyleneimine, according to latest word from the Southern Regional Research Laboratory. The versatile chemical is usually prepared by distilling a mixture of 2-amino-ethyl hydrogen sulfate and excess sodium hydroxide; 40% yield is optimum by the conventional technique. If the neutralization mixture is flash distilled, the product is instantaneously volatilized and isolated in yields as high as 83%.

•

Infra-Red Advance: Comprehensive correlation between the stereochemical configuration of steriods and the infra-red absorption spectrum is still a thing of the future. Researchers of the Sloan-Kettering Institute have taken a long step in this direction in their work with 3-acetoxy steroids—components of many important hormones. Noting that steroid acetates exhibit strong absorption bands, they showed that the trans isomer (to the 5-hydrogen) produces a single band while the cis isomers give several bands in the same region.

•

Dextran O.K.: Commercial Solvents Corp.'s dextran plasma extender, trade named Expandex, will soon be in commercial production. A new $1.5 million plant will go up at Terre Haute, Ind., on the strength of FDA approval of the company's product.

•

Anti-Cramper: After four years of research, Royal Pharmaceutical Factories, Brocades Stheeman, Amsterdam, Holland, are ready to market Cyclospasmol. It's a new anti-cramp remedy for use in cases of heart disease, gallbladder, intestinal, and muscular cramps. The drug has attracted much foreign interest.

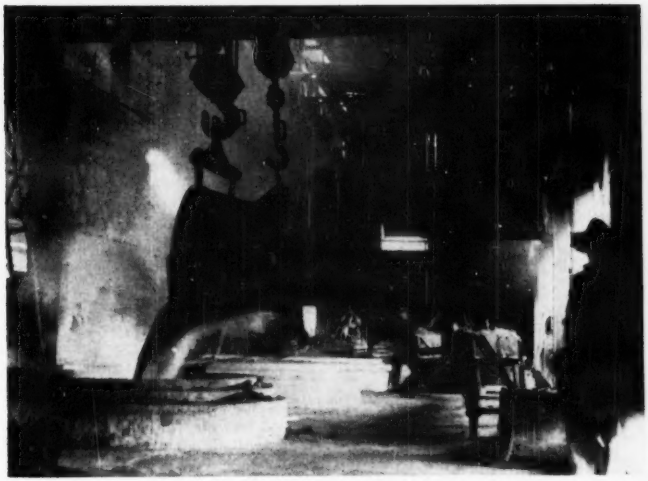
•

Diborane: New Atomic Energy Commission patents (U.S. 2,543,511; 2,544,472) cover the preparation of diborane by reacting a boron halide with an alkali (or an alkaline earth) metal borohydride, or by reacting an alkali metal hydride with a boron trihalide. Solution of the boron halide in an organic solvent accelerates the reactions.

•

Weather Makers: Study of effectiveness of new fungicides is speeded at New York State Agricultural Experiment Station, Geneva, by creating optimum temperature and humidity conditions for fungus growth. In a new technique toxic materials are first screened by spraying them onto specially coated glass slides and later adding a suspension of spores.

Those that "pass" are then sprayed on foliage or fruit, which is then washed (to test sticking quality), dried, and sprayed with spores. "Incubation" then speeds final results.



POINT PIRIE, SOUTH AUSTRALIA: Down is up—for sulfur recovery.

With Updraft: More Sulfur

Economic production of sulfuric acid from lead sulfide ores is the promise of a new Australian development, continuous updraft sintering of lead concentrates.

Updraft sintering replaces the conventional downdraft process, provides offgas with more than 5% sulfur dioxide, high enough for operation of a contact sulfuric acid plant.

Utilization of sulfur content of the sulfide ores mined in Australia will solve Australia's pressing sulfur shortage.

Cheaper sudfuric acid from lead sulfide ores is the promise of a new continuous updraft sintering plant for concentrates. Satisfactory operation of a pilot plant with an ore input of 50 tons per day at the refinery for the lead mines of Broken Hill Associated Smelters Pty. Ltd., Point Pirie, South Australia, provides solid backing for this statement.

In Australia, more combined sulfur is contained in the sulfide ores mined than could be utilized by the sulfur-starved Australian chemical industry. At present most of this sulfur is shipped abroad in concentrates, stockpiled or dissipated into the atmosphere with the roaster gases of the mine smelters.

Broken Hill decided to do something about this problem, install a contact sulfuric acid plant. But the Dwight-Lloyd downdraft sintering plant, employed at Point Pirie and at most other lead sintering plants throughout the world, did not produce a sufficiently high sulfur dioxide concentration to operate a contact sulfuric acid plant.

The Dwight-Lloyd unit consists of a traveling grate which is charged with lead ore at one end. After receiving ore the grate moves under a downdraft flame which sinters the ore and reduces the sulfur concentration to 2-3%. The flame is pulled completely through the ore bed by a suction box under the traveling grate. Sintered ore is dumped off the grate at the other end.

Unworkable: Unfortunately a Dwight-Lloyd plant produces too low a sulfur concentration for acid production. Attempts were made to modify the existing machines, but without success. Nor could the sulfur dioxide concentration be built up by gas recirculation.

A drastic change in sintering technique was obviously called for. Attention turned first to smelting the ore in a fluidized condition but without success. But these studies focussed attention on use of an updraft process because fluidized sintering is an updraft process.

Updraft processes have often been proposed for lead sintering but after many ups-and-downs over the past half century the continuous feature of the downdraft processes made it the dominant process.

In the 50-ton-a-day pilot plant a converted power house stoker grate, which travels 8-20 inches per minute, receives a portion of the charge. It then moves under a flame to start combustion of the ore. After combustion has begun the rest of the charge is added to form the final roast bed and the direction of air flow reversed.

Although it is still too early to shout about the success of the new up-draft sintering technique, Broken Hill officials have evidenced sufficient confidence in the new process to start construction of a full-scale 77 ft. x 10 ft. sintering plant to supplement its present operations at Point Pirie.

Dilution Eliminated: The wind box under the Dwight-Lloyd grate was the villain. It was impossible to prevent dilution of the off-coming sulfur dioxide by air leaks and by air entering at the frequent intervals when it is necessary to open the box to remove the "lead fall" for cleanup.

The pilot plant—a full scale plant is now being designed—produces a sinter with a quality equal to that of the downdraft plants. Also the rate of ore treatment is considerably higher.

Best of all, 80% of the sulfur content is removed in the updraft section of the furnace where the sulfur dioxide concentration can be maintained above 5%. And a 5% sulfur dioxide concentration is adequate for good operation of a contact acid plant. No more need be said.

With Pellets

Clay pellets used in production of high octane gasoline and other petroleum products are the product of a new clay pelletizer which is manufactured by Farrell-Birmingham. Still another application: pelletizing absorbent clays such as fullers' earth to provide better adsorption.

The clay is extruded under a pressure of 3000 psi and sized by cutting the extruded ribbon with a rotating knife. The extrusion screw is bored for coolant circulation. The lined and jacketed cylinder has a hinged head which supports the pelletizing die and cut-off mechanism.

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No Refrigeration

Fractionation of a compressed gas into hot and cold portions is accomplished in the Hilsch vortex tubes now being manufactured by Thermo Instruments Co. With these tubes the temperature of a portion of inlet compressed air can be reduced as much as 75 F merely by expanding air at 150 psi. through the tube.

Although relatively inefficient in terms of conventional refrigeration practice, they require only a supply of compressed gas to furnish refrigeration. Purchasers: Du Pont, General Electric, Allis-Chalmers, AEC, Bendix and many others.

Operation of the tubes is based on the so-called Ranque-Hilsch effect. Air enters the tube through an orifice set tangentially to the tube and produces a vortex, inside the tube. The energy content of the gas is redistributed by the vortex, cool air emerges from the center of the vortex while heated air, which collects near the tube walls, is removed at the opposite end of the tube. The maximum temperature diffierence is obtained when about 70% hot air and 30% cold air is withdrawn.

With Gauze Rings

More separation by a given height of distillation column is achieved by Dixon gauze rings now offered by Griffin & Tatlock, Ltd. Performances of as high as 56 theoretical plates per foot of height have been achieved. Fenske helices, at the same throughput, provided 40 theoretical plates, according to data provided by Sunbury research station of Anglo-Iranian Oil Co., Ltd.

Such performance can be obtained only by completely flooding the packing before beginning the distillation (B. P. 578,309 and 603,423). The excess liquid is removed before beginning the distillation but after boilup has started. According to the company, such efficiencies cannot be obtained by self-wetted packings under normal operating conditions.

The low pressure drop makes the Dixon packing very suitable for vacuum distillations. The Dixon packing is fabricated into cylinders from 60 or 100 mesh stainless steel gauze.

•

Low Speed Motor: Increased torque without increased external dimensions is achieved in the new Syncrogear electric motor which is produced by U. S. Electrical Motors, Inc. Key: Use of duplex gears in place of a single gear train. Models are built in sizes from 1 to 25 hp with speeds as low as 5 to 84 rpm.

High Vacuum Pump: F. J. Stokes Machine Co. has extended its line of oil-sealed rotary piston vacuum pumps. The new pump, the largest produced by Stokes, has a capacity of 500 cfm and can produce absolute pressures as low as 5 microns.

•

Small Mixer: Charles Ross & Son Co. is producing a one-pint kneader and mixer to answer the need for a pilot model for laboratory use. Driven by a ½ hp motor the new kneader is jacketed to permit heating or cooling of the material being treated. "Sigma" type stirrers are being used.

•

Cathodic Protection Guide: Federated Metals Division, American Smelting & Refining Co. has prepared a slide rule to determine the size of the magnesium anode needed for cathodic protection, its life, length of pipe protected and current output. It is available without charge to those engaged in cathodic protection work upon application on company letterhead.

•

Resilient Motor Base: General Electric Co.'s line of single-phase, capacitor induction motors are now available with a resilient base construction on motors rated ½ to 5 hp. Vibration isolation and extra-quiet operation result from the new construction.

•

Filter Fabrics: Whitehouse Products, Inc. is establishing an Industrial Fabrics Division to develop further use for filter fabrics made from such synthetic materials as Orlon. Heretofore Whitehouse has been primarily interested in sales of industrial weight fabrics to the commercial laundry and dry cleaning industry.

•

With Coke Oven Gas: Bethlehem Steel Corp. has developed a method of firing open hearth furnaces with coke oven gas under pressure. The new method is in operation at its mill at Sparrows Point, Maryland. The gas, which became available when natural gas replaced coke oven gas in the city gas supply, replaces a portion of the previously-used liquid fuels, bunker C fuel oil, coal tar or pitch.

•

Smog Control: Olefinic hydrocarbons must be kept out of the atmosphere if smog is to be controlled. This is the conclusion reached by researchers of the Los Angeles Air Pollution District after a two-year study. Investigation is continuing but it has already been determined that olefins react with air under the influence of sunlight; and the product of this reaction is a major troublemaker.

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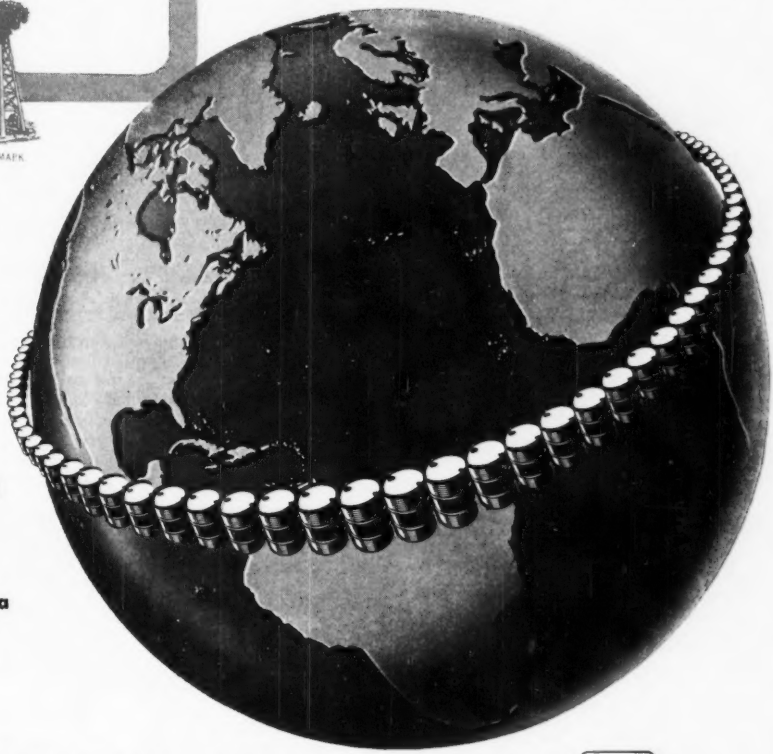

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- ★ Belgium
- ★ Egypt
- ★ France
- ★ Germany
- ★ Greece
- ★ Holland
- ★ India
- ★ Italy
- ★ Japan
- ★ Morocco
- ★ New Zealand
- ★ Pakistan
- ★ Scandinavia
- ★ South Africa
- ★ South America
- ★ Spain
- ★ Switzerland
- ★ Tunis
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STERNS, LTD., founded in 1887, is not only one of the pioneer oil companies, but one of the first petroleum companies to stress the importance of quality and research.

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TRI-SURE PRODUCTS LIMITED, ST. CATHARINES, ONTARIO, CANADA

1 REPRESENTATIVES of Fritzsche's technical service, sales, research and production departments discuss development of an odorant for a new emulsion paint.

2 BRIEFED on customer's aims, perfume researcher Ammersbach works on problem.

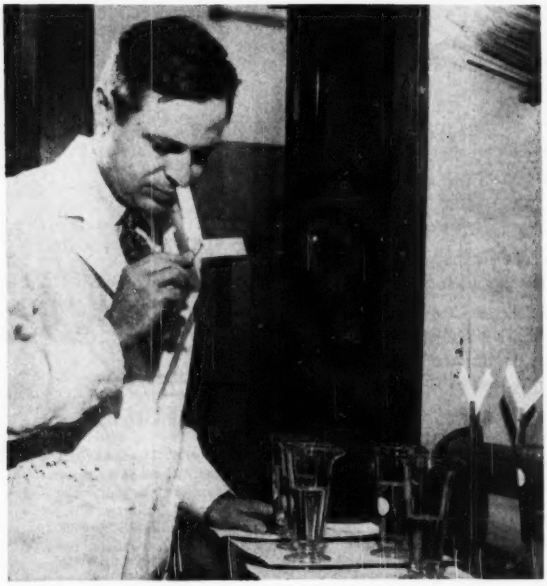
SPECIALTIES.....

Paint Sales Booster

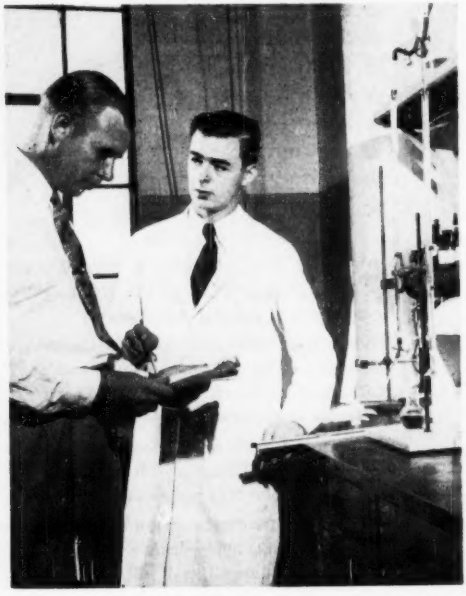
Consumers like their paint to be pleasantly scented or odorless as well as functional and decorative. Paint manufacturers and dealers know this. Hence the trend toward greater use of technical odorants in paint.

And the increasing popularity of water emulsion paints with odor-conscious amateur brush wielders, is bringing paint makers in even greater numbers to essential oils houses for masking agents.

Some manufacturers want only to mask the odor; others want to impart a particular fragrance to the product. Some want odor control only in the can; others, until the paint dries. A perfume chemist (Fritzsche Brothers' practices here pictured are typical) considers these preferences as well as questions of availability and price of raw materials, in devising a product for the job at hand. The odorant is added by the paint maker at some convenient stage in his process.

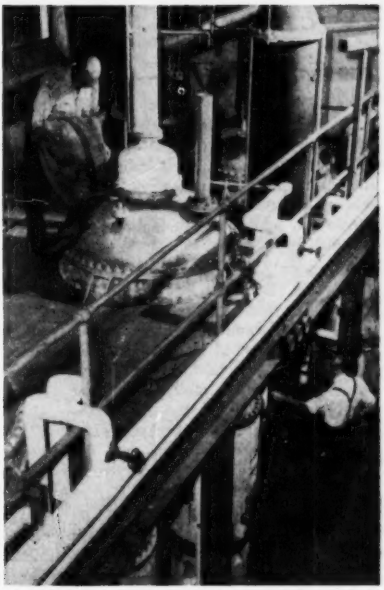


5 ORGANOLEPTIC analysis such as chemist Lewers is making, is standard on all ingredients shipped to N.Y.C. plant.



6 ALL raw materials are also given chemical and physical tests. Here Zimmer checks chemist Downey's report.

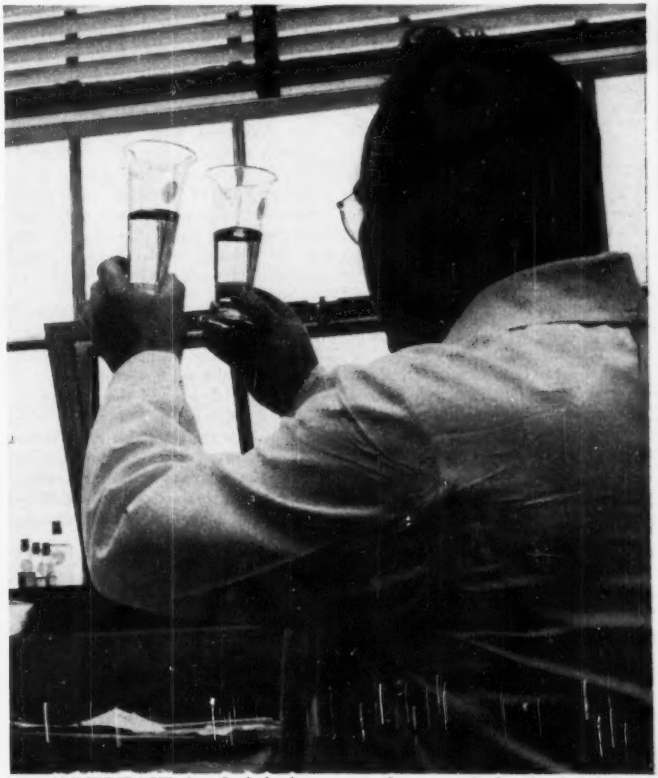
3 PERFUMED paint samples are shown to Ben Zimmer who, as head of production and control, advises on availability of materials, assists in evaluation.



4 ONE INGREDIENT, an essential oil, is distilled at company's Clifton, N.J., plant.

Most paint odorants are built around combinations of synthetic aromatics such as vanillin, heliotropin and cinnamic aldehyde, usually modified by essential oils—e.g., citronella, lemongrass and clove—and by isolates of essential oils, such as terpineol and safrole. Cost is a few cents per gallon of paint.

7 APPROVED INGREDIENTS are compounded according to the new formula.



8 AMMERSBACH gives final check to new masking agent he has developed. Paint maker will add it at some convenient point in his process.

Ice Substitute

A new formulation for preserving fish, fowl and game without refrigeration for a limited time has just reached national distribution. It is being sold in a sportsmen's kit containing 25 tablets of the preservative and a spray bottle for $2, has wide commercial possibilities.

The product, Noe-Ice, sloganized as a "miracle stay fresh spray", contains sodium benzoate (12.5 mg. per tablet) and Chloramine T (25 mg. per tablet) in a base of sodium chloride. It is claimed to retard the growth of bacteria that cause spoilage, without altering the taste of the food. National distribution has just been achieved via five jobbers, but the product has not yet entered the commercial market.

So says Irving Jacobs, president of Noe-Ice Sales Corp., Los Angeles, promotor of the Crosby Research Foundation project.

The sportsmen's kit, shipped in quantity only for the past month, contains a 125 cc spray-bottle and the tablets. For use, one tablet is dissolved in the bottle of water, and the solution is sprayed on a fish immediately after catching and killing, again after cleaning. Treated fish or game will then keep for two or three days in 70°-80° temperatures, but need additional sprays of Noe-Ice in hotter weather.

Enter the Promoter: Noe-Ice was developed in 1947 by two University of Washington chemistry students, George Dago and Howard Bessington, who marketed the first product in the Pacific Northwest as "Liquid Ice." Jacobs entered the picture later when they began looking for someone to promote it nationally.

Taken to the Crosby Research Foundation by Jacobs, Noe-Ice gained its approval. With a patent now pending, Jacobs sees little danger of competition although ingredients are known.

Among commercial possibilites, Noe-Ice can boast of keeping roses fresh for seven days without refrigeration, thus saving shipping costs. Also, in one experiment, treated spinach went via ship to Hawaii, arrived fresh and unwilted.

Easily-spoiled fresh-cooked Dungeness crabs were flown from Portland, Ore., to Mexico City without spoilage. Shipping time—more than 36 hours without refrigeration.

Florists have also found the tablets valuable for keeping flower water tanks fresh and odorless for long periods. Another odor-killing application: Sliced onion sprayed with Noe-Ice can be placed next to butter in a refrigerator without changing the taste of the butter, the company says.

Noe-Ice itself does not penetrate but forms a coating or kind of seal over foods. Therefore, it does not change the taste, Jacobs claims. If you drink it, the taste is salty, but it won't hurt you.

CMC-Quat Coating

Manufacturers of wax coatings for fruits and vegetables may find a future competitor in a new type of preservative coating that has come out of the chemical research lab of D. W. Bingham & Co. Pty. Ltd., Melbourne food processing and canning machinery firm. It's a gel of carboxymethyl cellulose as a carrier for cetyl trimethyl ammonium bromide. Patents on the coating are being applied for in the U.S. and elsewhere. The coat is applied as an aqueous emulsoid by spraying or dipping. If sprayed, a film less than one-thousandth of an inch thick forms on drying, which requires about three hours at normal temperature. Fruit takes on a slightly polished appearance.

The composition is claimed to be an improvement over wax or lacquer coatings because it merely slows down but does not stop the metabolic process which continues in untreated fruit for some time after picking. This enables fruit to "breathe" and delays the onset of autoenzymatic decaying. On the other hand, the coating sets up an efficient barrier against penetration of microorganisms, it is claimed.

Although the gel does not impair the taste of the product when left on, it can be easily washed off. Sampled separately, the gel tastes bitter.

Bingham developed the coating to help its customers spread out the canning of fruit and vegetable crops without expensive cold storage installations. The company is testing various other water-soluble cellulose derivatives with other quaternary ammonium compounds.

•

Carnauba Replacement: Concord Wax #407 is the latest replacement for imported natural waxes – principally carnauba and candelilla – developed by Concord Chemical Co. (Moorestown, N.J.). Chief advantages are price (47¢ per lb.) and high melting point (86 C.) Concord claims that using it, a manufacturer can produce a dependable water-wax emulsion at a cost of less than 50¢ a gallon; that such emulsions can be used for almost any purpose for which carnauba or candelilla emulsions are applicable—e.g., self-polishing floor wax, paper sizings and coatings, fruit dips and auto polishes.

•

Gordon Sells Out: Two Kansas City, Mo., men, Kenneth J. Stephany and Henry S. Bunting have recently bought the Gordon Chemical Co., from George C. Gordon, who founded the company in that city 27 years ago. Mr. Stephany has been chief chemist of Cook Chemical, from which he has resigned, and Mr. Bunting has been on the sales staff of Thompson-Hayward Chemical.

•

Cleaner-Germicide: Korex is the trade name of a new liquid germicidal cleaner that Huntington Laboratories (Huntington, Ind.) has developed for maintenance cleaning. Composed of soap, synthetic detergent, germicide and a penetrant, it is claimed to destroy germs (phenol coefficient of 2) as it cleans.

•

Germicidal Soap: Skotch Products (Cleveland) has just gone into production on a new germicidal hand soap, called Germisoap, for the industrial field. Active ingredient is 2,6-dimethyl - 4 - hydroxychlorobenzene, which is present in a lanolin base. The product is available in several granulations for heavy, medium and light duty. When used regularly, it is said to reduce dermatitis-causing skin bacteria.

•

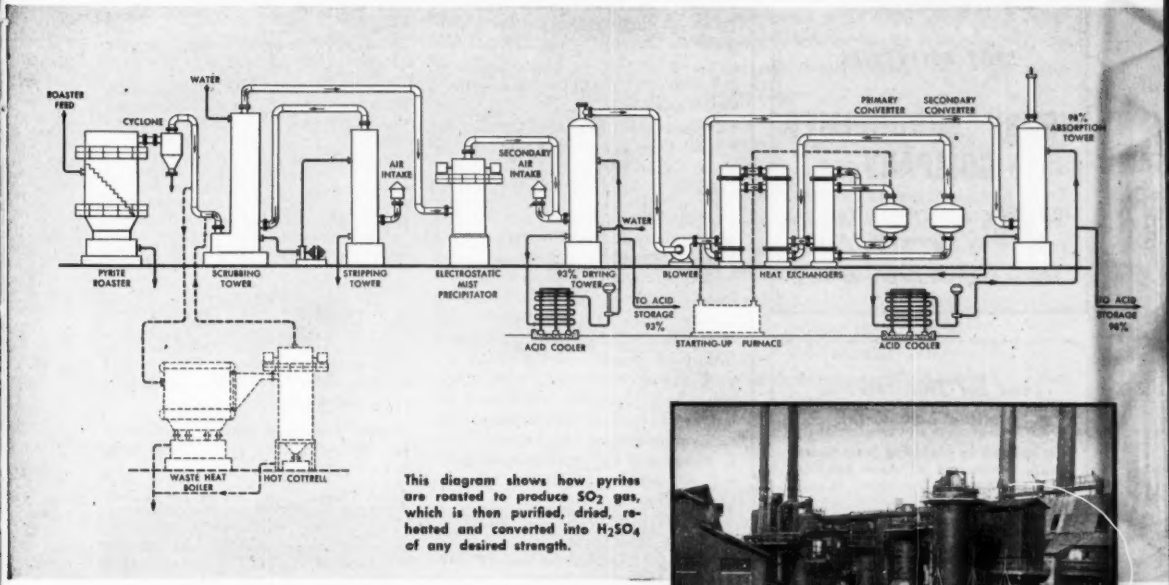
Rose Spray: Iscothan, a wettable powder containing 15% dinitro capryl phenyl crotonate as the active ingredient, is now being sold for spray control of mildew on roses by Innis, Speiden & Co. (New York City) following successful testing by agricultural experiment stations and rose growers' associations. It is $1.75 per lb. in 125 lb. drums or $2.10 per lb. in 8 lb. drums.

•

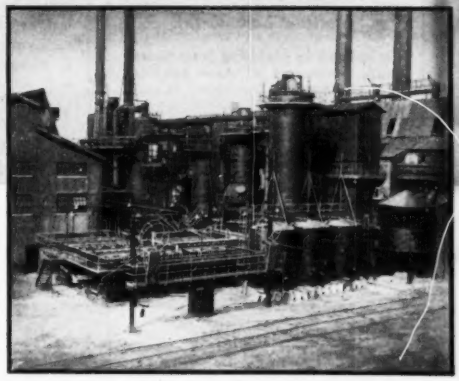
Pennsalt Sours: Two new neutralizers for laundry and textile use, Erusto-Max and Erusto-Ray, have been developed by Pennsylvania Salt Manufacturing Co. Both contain the brighter, Lexite, which makes the bluing operation unnecessary. The former, to be used dry-to-the-wheel or in solution, has a very high neutralizing value, holds souring to a neutral range within the wheel and completes the neutralization process as fabrics are ironed, tumbled or dried. The latter, intended for dry-to-the-wheel use only, reacts more in the manner of conventional sours.

Another practical solution to the sulfur shortage

Make Sulfuric Acid from PYRITES



This diagram shows how pyrites are roasted to produce SO_2 gas, which is then purified, dried, re-heated and converted into H_2SO_4 of any desired strength.



For additional information on this Chemico process write for Bulletin S-102

HERE's a practical answer to the sulfur shortage. With the Chemico acid process diagramed above, vitally needed sulfuric acid can be manufactured from ores such as pyrite, pyrrhotite and other metal sulfides which are in plentiful supply. The Chemico acid process can be adapted to use the sulfur dioxide gas from any preferred standard type of roaster.

Our wide experience in the design and construction of acid-making facilities enables us to deliver efficient plants on a performance-guaranteed basis.

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BOOKS . . . . . .

An Introduction to the Chemistry of the Silicones, second edition, by Eugene G. Rochow. John Wiley & Sons, New York, N.Y.; xiii+213 pp., $5.

With the increasing success of silicones in the industrial world, the author proposes to set forth for engineers, chemists and industrial designers a critical survey of the field of silicon and organosilicon derivatives. Besides reviewing the physical and chemical properties of silicones and explaining just what they are, this second edition presents up-to-date theories on the subject, discusses types that have been developed, methods for preparation, and possible uses. The author emphasizes silicone polymers in the light of their commercial importance.

Fundamentals of Atomic Physics, by Saul Dushman. McGraw-Hill Book Co., New York, N.Y.; x+294 pp., $5.50.

In aiming to outline the fundamentals of atomic and nuclear physics in a logical manner, the author is guided by a quantitative approach to his subject. Accordingly, he includes in the volume a history of mathematical techniques and formulas as well as a history of physics; in discussing the problems of atomic and nuclear structures, he explains the quantitative relations involved. Recent developments concerning nuclear phenomena, atomic energy and the production of high-voltage particle accelerators are particularly noted.

Briefly Listed

LINEAR COMPUTATIONS, by Paul S. Dwyer, 344-page book using a general mathematical approach rather than specifically statistical methods in dealing with the problem of finding numerical solutions for sets of simultaneous linear equations. Illustrative problems appear throughout book. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York, N.Y., at the price of $6.50.

TIMESTUDY FUNDAMENTALS FOR FOREMEN, by Phil Carroll, 209-page second edition presenting the basic principles of timestudy to foremen, with a step-by-step discussion of the procedures for making such a study; goes on to show how timestudy results are translated into working system of standard data. McGraw-Hill Publishing Co., 330 W. 42 St., New York, N.Y., price: $3.

A SYMPOSIUM ON DEVELOPMENTS IN APPLIED CHEMISTRY, the twenty-fifth annual series of Priestly Lectures comprises lectures by authorities on such pertinent subjects as household chemistry, biochemistry's future, glass technology and ceramics, etc. Sponsored and offered by Phi Lambda Upsilon, Dept. of Chemistry, The Pennsylvania State College, State College, Pa., for $2.

FLUID AND PARTICLE MECHANICS, by C. E. Lapple, 353-page study reviewing recent developments in the field of fluid mechanics as they pertain to industrial applications in the chemical sphere. Theoretical background is kept to a minimum, with only enough presented to afford understanding of the methods and limitations of application. Based on a graduate chemical engineering course given at the University of Delaware, Newark, Del., and published by this organization.

BIBLIOGRAPHY, SUPERSONICS OR ULTRASONICS, 1926-1949, with supplement to 1950, compiled by B. Curry, E. Hsi, J. S. Ambrose, and F. W. Wilcox. Lists technical publications covered, contains subject index, listing of topics, and author index in addition to similarly arranged supplemental section. From the Research Foundation, Oklahoma Agricultural and Mechanical College, Stillwater, Okla., for the price of $2.

WORKMEN'S COMPENSATION PROBLEMS, Bulletin #142, comprises a 248-page review of the proceedings of the 36th convention of the International Association of Industrial Accident Boards and Commissions; basic principles of workmen's compensation are discussed as well as pertinent medical factors and occupational hazards. Available from the Bureau of Labor Standards, U.S. Department of Labor, Washington 25, D.C., at 50¢ per copy.

MEETINGS . .

Natl. Soybean Processors Assn., annual meeting, Edgewater Beach Hotel, Chicago, August 16.

Tanners' Council of Amer., annual meeting, Waldorf-Astoria Hotel, New York, N.Y., August 21-22.

Amer. Pharm. Assn., Statler Hotel, Buffalo, N.Y., August 26-31.

Summer Symposium, Nuclear Energy Development, annual meeting, Oak Ridge, August 27-September 7.

Amer. Chem. Soc., Diamond Jubilee Meeting, New York, N.Y., September 3-7.

Amer. Soybean Assn., annual meeting, Fort Des Moines Hotel, Des Moines, Iowa, September 6-8.

Natl. Instr. Conf. & Exhibit, Sam Houston Coliseum, Houston, Texas, September 10-14.

Amer. Inst. of Chem. Engineers, Sheraton Hotel, Rochester, N.Y., September 17-19.

Conf. on Ind. Experimentation, Columbia campus, Columbia Univ., New York, N.Y., September 17-21.

PICTURES IN THIS ISSUE:

Cover (top)—National Film Bd.; Cover (bottom) pp. 26, 27—L. Crawford, McGraw-Hill; p. 9—Harris & Ewing; p. 21—Western Pine Assn.

SULPHUR

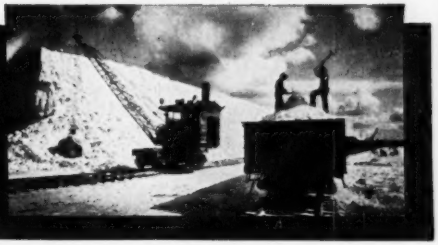
*Interesting Facts Concerning This Basic Raw Material from the Gulf Coast Region

*MOLTEN SULPHUR

The discharge lines from the wells deliver the sulphur into sumps at collecting stations which are located near the area being "steamed."

The sump is dimensioned to suit operating conditions, as well as the number of wells supplying sulphur. Cast iron has been found the most suitable material for lining the sump, and for the steam coils on the bottom and at the sides which keep the sulphur in a liquid state. When the sump is reasonably full, pumps force the liquid sulphur through insulated pipe lines to the vats. The pumps are especially designed for this service, the moving parts being either submerged in liquid sulphur or steam-jacketed.

Loading operations at our Newgulf, Texas mine



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Diethyl Phthalate

Dibutyl Phthalate

Di-(2Ethyl Butyl) Phthalate

Dioctyl Phthalate (DOP)

Di-(Methoxy Ethyl) Phthalate

Triacetin

Tributyrin

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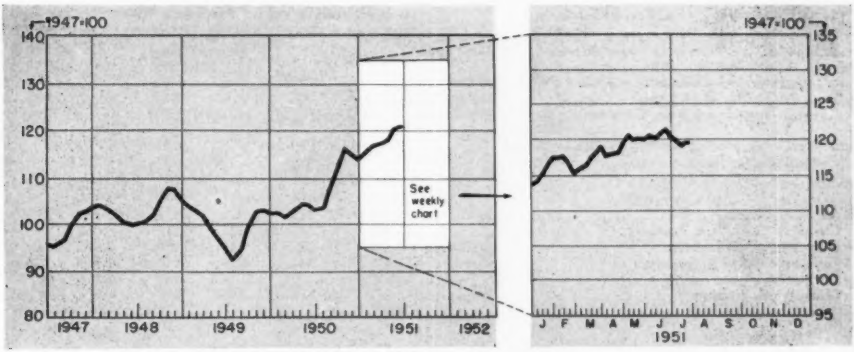
CHEMICAL MARKETS....



CHEMICAL INDUSTRIES OUTPUT INDEX — Basis: Total Man-Hours Worked in Selected Chemical Industries

Chemical manufacturers are beset with uncertainty about Washington's plans, but they are not in doubt about the recent trend—increasing U.S. exports. Latest government figures show chemical exports are now running better than $85 million monthly. At the start of the year, they were only $55 million. Significant rise: caustic soda and soda ash.

Despite the improvement in chemical supplies at home, producers are still operating at capacity in most cases. But they eye the potentialities of an expanding foreign market, and prepare to meet coming competition there from European countries.

To strengthen overseas economic beachheads, many manufacturers are expanding operations both here and abroad. One such example: Reichhold Chemicals, Inc. is investing $10 million to double its production of phenol and phthalic anhydride in the U.S. Concurrently, facilities are to be enlarged in all company plants, nine in this country, and sixteen in other parts of the globe.

With the whopping outputs in styrene, phenol, phthalic anhydride, (and many more chemicals) due before the end of 1952, the hunt for overseas markets is expected to quicken. Exports will play a larger role for two major reasons: Vast untapped markets, and a cushion for future demand fluctuations.

While market development planners handle these future problems, sales managers are more concerned with the present day. The production index is down about one per cent to slow further inventory rise. Firmer note: the price index has steadied.

Whatever time extension may be granted to the Office of Price Stabilization bodes some additional chemical price declines. But chances are that rollbacks, if any, will be much easier than originally proposed under CPR-22.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	119.0	119.7	105.3
Bituminous Coal Production (Daily Average, 1000 Tons)	1,623.0	1,480.0	1,512.0
Steel Ingot Production (Thousand Tons)	2,027.0	2,037.0	1,893.0
Wholesale Prices—Chemicals and Allied Products (1926=100)	139.1	140.5	117.7
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	244.0	238.7	774.3
Chemical Process Industries Construction Awards (Eng. News-Record)	$34,451,000	$6,438,000	$3,786,000

MONTHLY BUSINESS INDICATORS—TRADE (Million Dollars)	MANUFACTURERS' SALE			MANUFACTURERS' INVENTORIES		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	23,733	22,389	19,309	38,828	37,859	29,659
Chemicals and Allied Products	1,731	1,631	1,334	890	873	587
Paper and Allied Products	699	673	513	2,694	2,617	2,014
Petroleum and Coal Products	1,853	1,842	1,624	2,316	2,230	2,018
Textile Products	1,415	1,270	1,012	3,381	3,262	2,148
Leather and Products	269	284	290	662	644	546

Sales of strategic materials to the General Services Administration have been exempted from price ceilings by the OPS. Domestic sales from marginal producers or from specially constructed facilities are also free of price restriction. Some anticipated results: more manganese made at home, more tin and castor oil from abroad.

Attempts to fix prices are not just limited to the OPS these days. The American Turpentine Farmers Association proposed this week that naval stores producers withhold their production from the market for sixty days, or until rosin and turpentine recoup recent price declines.

The National Production Authority made another move this week to conserve chemicals needed in the defense program. Latest additions: chrome yellow and chrome orange pigments; phenol-formaldehyde resins. Reasons: U.S. shortage of lead; DO pressure for the resins.

Many hands and heads are trying to relieve the worldwide shortage of sulfur. It looks like production from foreign sources will be needed to fill the supply-demand gap. Sulfur production in the United States is still on a plateau: 2,690,000 long tons for the first half of 1951, compared to 5,342,000 long tons for all of 1950. The production rate is almost identical, with existing facilities operating at capacity.

Best prospect of foreign supply relief: Mexican producers expect to be exporting sulfur late this year.

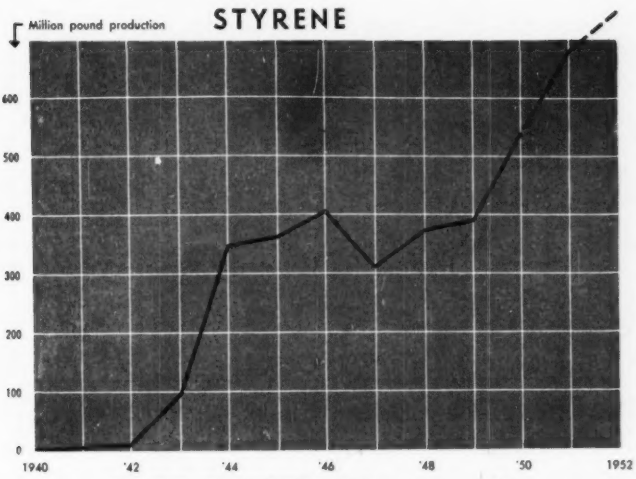
The drive to conserve and produce more sulfur is responsible for increasing tightness in monoethanolamine. The reason: wider usage in recovery of sulfides from refinery by-product gases.

On the resale market, supplies of chemicals improve and prices continue to soften. Fastest mover on this front this week has been the plasticizer-for-export market. Prices of phthalates are now 10-15¢ a pound above the manufacturers' quotations, but they are selling.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending July 23, 1951

	Change	New Price		Change	New Price
UP					
Copper Cyanide	$ .01	$ .62	Rosin, WW, Savannah, cwt.	$ .65	$8.35
DOWN					
Carnauba Wax, No. 1 Yellow	.05	1.22	Turpentine, Savannah, gal.	.09	.65
Tung Oil, imported, tanks	.01	.36			

All prices per lb. unless quantity is stated.



STYRENE PRODUCTION: Producers see no ceiling.

As Molders Cheer

Three major producers will boost styrene output, push to around 670 million pounds in 1951 and 750 million pounds in 1952.

Synthetic rubber will take lion's share this year, but more is slated for plastics molders and other users in the future.

Styrene producers set sights for billion pounds per year by 1955, if synthetic rubber is not cut back.

Faces of polystyrene molders were all smiles this week. The occasion: Three major producers have embarked on expansion to boost styrene output next year some 40% over the 1950 total. By the end of 1955, many in the industry look to an annual production surpassing a billion pounds.

In its brief commercial career, styrene has climbed from less than a million pounds in 1939 to 539 million in 1950. CW estimates around 670 million pounds in 1951, and something over 750 million pounds for next year. Yet despite the herculean efforts of producers, plastics molders have rarely said "Hold, enough."

Synthetic Needs: Biggest stumbling block to the molders' desires has been the need for GR-S rubber. During World War II, the synthetic rubber industry had to be created almost overnight to make up for the choked-off supply of natural rubber. The GR-S synthetic, containing some 23% styrene, preempted the greater part of styrene output, and molders had to take what was left.

In the war's wake, most of the synthetic rubber production was slashed sharply, but still there wasn't enough styrene. More users found more uses too fast. In 1947, Monsanto Chemical Company, one of the leading producers, was out of styrene manufacture for a year because of the Texas City disaster. In 1949, plastics usage exceeded rubber for the first time. For a few months, molders found supplies fairly plentiful during the so-called "inventory recession". Since then, demand has been well ahead of supply.

The shock of Korea revitalized the synthetic rubber industry in mid-1950. The goal for 1951 is 760 thousand tons, with a 100 thousand ton increase slated for 1952. New formulations call for about 20% styrene, or in the vicinty of 350 million pounds next year, more than half of present output. This record demand on top of plastics needs is far beyond present capacity—hence the boost.

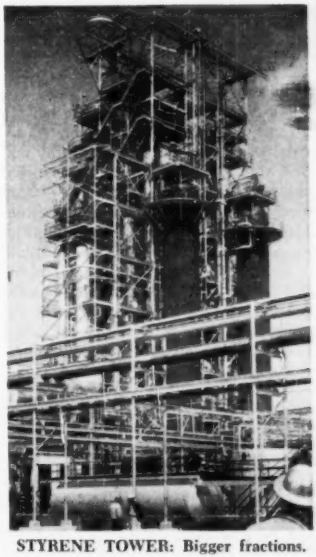
More in Making: Of the four major producers, three are in the process of expansion. The trio: Dow Chemical Company, Monsanto, and Koppers Co., Inc. Another manufacturer, the Bakelite Division of Carbide and Carbon, is expected to join up when more benzene, and more process equipment become available.

Dow will bring in new output later this year as well as next; most of the Monsanto and Koppers expansions should be on stream by this time in 1952. Latest certificates of necessity (allowing 70% of a five-year tax write-off) call for these expenditures: Dow $1.6 million; Monsanto $8.6 million; and Koppers $4 million.

This ambitious program is predicated on getting enough benzene soon enough, but this problem had been pretty well worked out through industry advisory committees of NPA. For extra safety Dow will also send $10.2 million to make vinyl toluene, said to have properties comparable to styrene.

So Big: Producers are not just counting on synthetic rubber and the plastics molders to absorb their output. They know there is a huge potential market for styrene in rubber-paint latices, styrenated oils, synthetic shoe soles and floor tiles, ion exchange resins and other uses still under wraps. Foreseeable demand for these uses already is beyond the 100 million pound mark annually.

Producers are confident of a continued styrene boom in private industry. The only cloud on their horizon: the government might again scuttle or hamstring synthetic rubber production. But if past experience means anything in Washington, the synthetic rubber industry will be on the scene for a long, long time. In that event, styrene producers should be as pleased in the years to come as the molders are today.



STYRENE TOWER: Bigger fractions.

Exports on Rebound

Now that U.S. chemical inventories are at the highest level since Korea, importers and exporters scan foreign trade reports with heightened interest. Reason: The prospect of stepped-up competition in the international market. For, with the expansion of U.S. chemical production since Korea, and the post-war revival of European chemical industry, the economic battle for the world's chemical dollar is due to intensify.

Just how soon the fray begins depends on one major imponderable—how much U.S. mobilization and when. The immediate reaction to Korea has by this time largely subsided, but much of the impact remains. On the heels of this crisis came the hot-and-heavy demand that brought scare-buying, excessive inventories, and a persistent call for European imports. European producers, however, either were unable to meet the sudden pressure, or preferred to re-establish the foundations of foreign trade in other countries.

What Figures Say: Prodded by mobilization, U.S. monthly chemical imports rose from $33.2 million for the first quarter of 1950 to $92 million by the second quarter of 1951. Sharpest rise: $34.1 million to $65.5 million in the last two quarters of 1950.

Exports climbed from $165.8 million in the first quarter of 1950 to an estimated $255 million in the second quarter of this year. A gain of more than $55 million, largest of this eighteen month period, has been marked up in the recent April-June quarter.

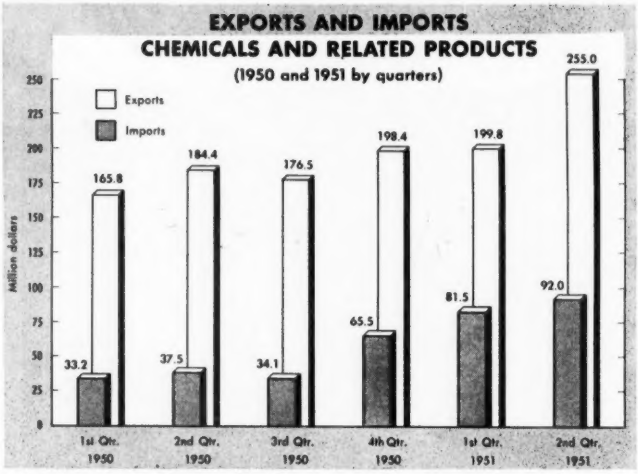
Without the allocations introduced by the Office of International Trade, this growth would have been substantially more.

Among the individual chemical groups, medicinals and pharmaceuticals have set the pace—and still do. Still no appreciable upturn has been shown in this class, due in some measure to growing competition from European producers. Current monthly exports: somewhat over $25 million.

Industrial chemical exports in May, 1951 were in the $15 million-a-month bracket, a healthy gain over the $9 million-a-month at the end of 1950. Imports of industrial chemicals are still gaining, but at a reduced pace. Now, at $13 million a month, they are more than five times the value of the preceding year.

On the Slate: Much of the future pattern of U.S. chemical foreign trade awaits the outcome of differences between the Pentagon and the Kremlin. But a continued, if uneasy, peace will witness a sharpened competition for the world chemical market.

It is likely that the scene of this competition will be centered in South America and Asia, where the biggest new markets loom. And it is most likely, also, that the strongest competitor will be Germany, now waging a vigorous campaign to regain pre-war volume in chemical foreign trade.



EXPORTS AND IMPORTS: Mobilization will make the pattern.

GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
Navy Purchasing Office, 111 E. 16, N.Y.:			
July 31	9239	480,000 lbs	Calcium Carbide
	9241	122,000 lbs	Scouring Compound
July 30	9247	5,000 lbs	Non-Foaming Inhibitors
Aug. 7	9251	50,000 lbs	Sodium Metaphosphate
HQ, Air Material Command Wright-Patterson AF Base, Dayton 1, Ohio:			
July 30		5,500 lbs	Dibromodifluoromethane
Armed Services Med. Proc. Agency:			
July 31	52-5B	7,680 pkgs	Diptheria Toxin
July 31		12,240 boxes	Penicillin Ointment

GOVERNMENT AWARDS

Item	Supplier	Location
Aviation Supply Office, 700 Robbins Ave., Phila. 11, Pa.:		
Turpentine, Type 1	Newport Industries, Inc.	New York, N.Y.
Primer Paint	Zac-Lac Paint & Lacquer Corp.	Atlanta, Ga.
" "	Lasting Products Co.	Baltimore, Md.
Primer Lacquer, Synthetic	Rinshed-Mason Co.	Detroit 10, Mich.
Enamel, Rust Inhibiting	Pabco Products, Inc.	San Francisco, Calif.
Enamel & Zinc Chromate Primer Paint	Pacific Paint & Varnish Co.	
Paint Thinner, Synthetic	McGuire & Co.	Oakland, Calif.
Paint Thinner, Volatile Mineral Spirits	Pioneer Oil Co.	Phila 43, Pa.
Chicago Chemical Proc. District, 226 W. Jackson Blvd., Chicago, Ill.:		
Chlorinated Paraffin, Type 1 CC Stock No. 135901	Diamond Alkali Co.	Cleveland, O.
HQ Air Material Command, Dayton, O.:		
Aircraft Cleaning Compound, Class —07—	R. M. Hollingshead Co.	Camden, N. J.
N.Y. Chem. Proc. District, 111 E. 16, N.Y. 3:		
Green Dye (for coloured smoke mix-Amer. tures)	Aniline Products Inc.	New York, N.Y.
Red Dye		New York, N.Y.
Thickener, M-2	Ferro Enamel Corp.	Cleveland, O.
	McGean Chem. So.	Cleveland, O.
	Witco Chem. Co.	New York, N.Y.
Clothing Impregnation Chemicals, M-3	Yardley's of London, Inc.	Union City, N.J.
	Lambert Pharmacal Co.	St. Louis, Mo.
Zinc Oxide	St. Joseph Lead Co.	New York, N.Y.
	New Jersey Zinc Sales Co.	New York, N.Y.
U.S. Navy Purchasing Office, Norfolk 11, Va.:		
Calcium Carbide	National Carbide Co. (Air Reduction Co.)	New York, N.Y.
Chem. Corps Proc. Agency, Army Chem. Center, Md.:		
Activated Dessicant, Type V. Grade B.	Filtron Corp.	Los Angeles, Calif.

MPS-500

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Compositions containing MPS-500 show good flexibility at ordinary and low temperatures, good all-around mechanical properties and good processing characteristics.

Particularly valuable is the high permanence of the compositions, showing very low plasticizer loss on heating and on extraction with water and oil.

Used alone, MPS-500 compares closely with tricresyl phosphate in efficiency. However, it is superior to the latter in low-temperature flexibility. Its use with other plasticizers makes possible a wide range of desirable properties.

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BULLETIN 35 contains properties of MPS-500; comparisons with other plasticizers; effects of aging by heat, water and gasoline; recommended stabilizers; and typical formulations and uses. Write today, on your company letterhead, for a copy.

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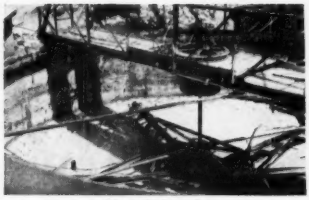
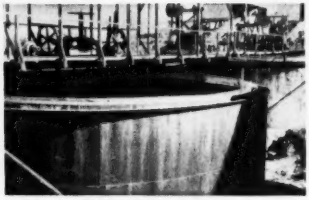

45' x 12' Dorr Co.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Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

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Editorial Items:—Numerals are page numbers; the ABC's distinguish among items where more than one is on a page. There is a number on the coupon for each item referring to new products, equipment, and literature.

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Bistrium Bromide 22B
Decamethonium 22A
Expandex 22C
STH 21A

NEW EQUIPMENT

Cathodic Protection Guide 24E
Filter Fabrics 24G
High Vacuum Pump 24C
Low Speed Motor 24B
Pelletizer 23A
Refrigeration Tube 24A
Resilient Motor Base 24F
Small Mixer 24D

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- Liquid chlorine 7a
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- Magnesium silica fluoride T30b
- Monochloracetic acid T24b
- Monochloracetic sodium T24c
- Napthalene T24d
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- Cascade coolers 13e
- Concentric 13f
- Plate 13d
- Series 240A 13c
- Shell-and-tube 13a
- Style FH 13b

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- High melting point T19
- Microcrystalline
  - Hard & Plastic 18f
  - Hard brittle 18a
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Expires October 28

BOOKLETS . . . . . .

Chemicals

Pentachlorophenol Wood Preservative

17-p. bulletin containing compilation of 60 specifications as a guide to the usage of pentachlorophenol wood preservative as issued by state, federal and armed forces agencies. Specifications range from those for the chemical itself to formulations for treating structural lumber and poles. Monsanto Chemical Co.

Naphthenate Driers

16-p. booklet discussing the firm's naphthenate driers with information on naphthenates as compared with other type driers, the manufacture of these driers, and an explanation of the individual drier metals; the concluding section deals with miscellaneous drier uses — paste driers, paints, boiled oils, varnish cooking, and alkyds. Naftone, Inc.

Carbon Black

Folder consisting of chart classifying carbon blacks for use in various types of rubber compounds, according to group, brand name and manufacturer; also described are firm's facilities and services in dealing with application or performance problems in the rubber field. Godfrey L. Cabot, Inc.

Equipment

Electromagnet

Paper by Francis Bitter of M.I.T. and firm's F. Everett Reed reviewing the development of an iron core magnet for general laboratory use, including information on design considerations and operating characteristics at the 20 KW power input level, plus an explanation of basic construction details. Arthur D. Little, Inc.

Combustion Tube Furnace

4-p. bulletin describing the construction, control and operation, specifications and dimensions of combustion tube furnaces which find application primarily in carbon determination work but are also used in standard combustion and special organic analysis. Hevi Duty Electric Co.

Electrical Metallic Tubing

Bulletin featuring "Dekoron-Coated" galvanized electrical tubing with a polyethylene coating designed to reduce wiring replacements costs in those process industries where corrosive conditions are present; engineering data tables list effects of chemical reagents on polyethylene, electrical properties of polyethylene, mechanical properties, etc. Republic Steel Corp.

Rod Mills

12-p. catalog giving information on rod mills for both wet and dry grinding and crushing with reference to the proper application fields, methods of construction and design features of the various types of rod mills plus specifications on sizes, weights, rod charges, speeds, etc. Hardinge Co.

Milling Systems

8-p. bulletin discussing milling systems for controlled granulation of chemical products, covering such equipment as various types of roller mills for single or multiple-stage grinding, sifters for grading, flaking mills and the double-drum dryer. Allis-Chalmers Mfg. Co.

Flat Top Conveyor Chain

20-p. booklet explaining construction and new practical applications of table-top chain for use in can and bottle handling machinery; engineering data is given plus a table of strength, weights, dimensions and prices. Chain Belt Co. of Milwaukee.

Stainless Steel Pipe

Set of data sheets describing "Schedule 5" stainless pipe as to its advantages and performance results, along with technical data on wall thickness, weight, and pressures. The Carpenter Steel Co.

Pyrometers

Bulletin dealing with two portable pyrometer models for use with thermocouples in rapid and accurate spot checking of temperatures on industrial heating equipment. Wheelco Instruments Co.

Thermometers

8-p. bulletin containing descriptive information and specifications covering recording, dial indicating and freezer type thermometers plus recording gauges in three models — pressure, compound and vacuum. The Electric Auto-Lite Co.

Reciprocating Pump

8-p. bulletin describing design and construction features of 6" stroke direct flow pump series finding application in chemical handling, descaling systems, hydraulic systems and oil field service. The Aldrich Pump Co.

Synthetic Filter Cloths

6-p. folder with actual samples of six different types of synthetic filter cloths for use in all types of pressure and vacuum filters; compares various available fabrics and contains selector chart indicating which materials are most effective for typical corrosive chemicals and solvents. Filtration Engineers, Inc.

Alloy Steel Tubing

4-p. bulletin dealing with carburizing grades of tubing steels for mechanical uses; presents data on microstructure, critical points, effect of alloy elements, forging, machining, welding and thermal treatment. The Babcock & Wilcox Tube Co.

Diaphragm Slurry Pump

6-p. folder devoted to diaphragm slurry pump which is designed to operate without mechanical linkage for transmitting force to the diaphragm; included are application information, installation notes and a dimensional data diagram. Oliver United Filters, Inc.

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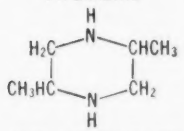
New Research Chemicals for *your Future Products*

BUTYL DIETHANOLAMINE

$CH_3CH_2CH_2CH_2N(CH_2CH_2OH)_2$

Boiling Range: 270-275°C.
Textile Chemical Intermediate

2,5-DIMETHYL PIPERAZINE



Melting Point: 115.5°C.
Pharmaceutical Intermediate

N-HYDROXYETHYL DIETHYLENE TRIAMINE

$H_2NC_2H_4NHC_2H_4NHC_2H_4OH$

(Contains about 20 per cent Dihydroxyethyl Diethylene Triamine)

For Oil Soluble Emulsifiers

N-ETHYL ETHANOLAMINE

$CH_3CH_2NHC_2H_4OH$

Boiling Point: 167.1°C.
Pharmaceutical Intermediate

AVAILABILITY:
Research Quantities

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